COLOR LASER COPIER
700/800

SERVICE MANUAL

REVISION 2

Canon

NOV. 1996

FY8-13D5-020

CANON COLOR LASER COPIER 700/800 REV.2 NOV. 1996 PRINTED IN JAPAN (IMPRIME AU JAPON)

IMPORTANT

THE INFORMATION CONTAINED HEREIN IS PUBLISHED BY CANON, INC., JAPAN, AND IS FOR REFERENCE USE ONLY. SPECIFICATIONS AND OTHER INFORMATION CONTAINED HEREIN MAY VARY SLIGHTLY FROM ACTUAL MACHINE VALUES OR THOSE FOUND IN ADVERTISING AND OTHER PRINTED MATTER.

ANY QUESTIONS REGARDING INFORMATION CONTAINED HEREIN SHOULD BE DIRECTED TO THE COPIER SERVICE DEPARTMENT OF THE SALES COMPANY.

Printed in Japan
Imprimé au Japon

Use of this manual should be strictly supervised to avoid disclosure of confidential information.

Prepared by

OFFICE IMAGING PRODUCTS TECHNICAL SUPPORT DEPT.1
OFFICE IMAGING PRODUCTS TECHNICAL SUPPORT DIV.

CANON INC.

30-2 Shimomaruko 3-chome, Ohta-ku Tokyo 146 Japan

CANON COLOR LASER COPIER 700/800 REV.2 NOV. 1996 PRINTED IN JAPAN (IMPRIME AU JAPON)

INTRODUCTION

This manual is compiled to provide the service person with the basic facts about the Color Laser Copier 700/800, thereby ensuring its quality and performance through servicing in the field.

The Color Laser Copier 700/800 may be configured with the following system units and options.

	CLC700	CLC800
Buffer Pass Unit 1	OP	OP
Staple Sorter F1	OP	OP
Sorter D1	OP	OP
RDF E1	OP	OP
Film Projector 1	OP	OP
Editor F1	OP	Standard/OP
CCV	OP	OP
IPU-10S	OP	OP
PS-IPU	OP	OP
Film Scanner	OP	OP
Film Scanner III	OP	OP
IPU Interface	OP	Standard/OP

OP: Option
Standard/OP: Depends on model.

For the RF, Sorter, IPU, IPU II, PS-IPU, PS-IPU III, Film Scanner, and Film Scanner III, see their respective service manuals; the descriptions in this manual are limited to those on the copier and editor.

This SERVICE MANUAL consists of the following chapters:

1. Scanner Unit

CHAPTER 1, "General Description," gives the CLC700/800's features and specifications.

CHAPTER 2, "Copying Process," describes the individual processes used to generate copies.

CHAPTER 3, "Operations and Timing," explains the CLC700/800's mechanical and electrical mechanisms by function.

CHAPTER 4, "Mechanical System," discusses the CLC700/800's mechanical construction, and shows how to disassemble, assemble, and adjust the copier.

CHAPTER 5, "Installation," sets forth the site requirements, and gives step-by-step instructions on how to install the copier.

CHAPTER 6, "Maintenance and Servicing," contains tables of periodically replaced parts and tables of durables and consumables; the chapter also contains a scheduled servicing chart.

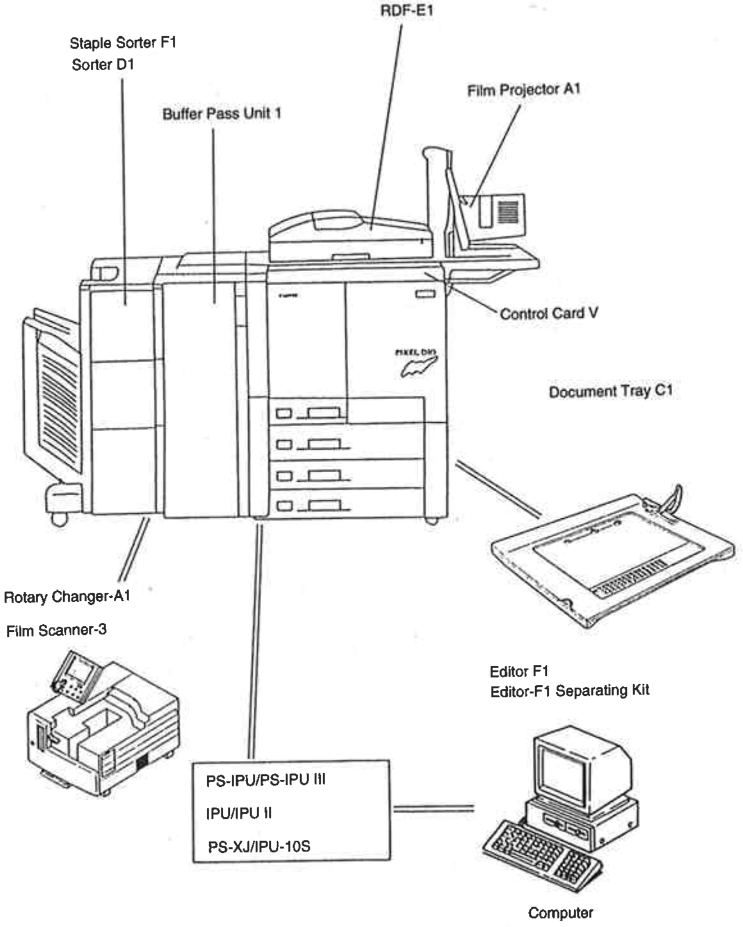
CHAPTER 7, "Troubleshooting," discusses maintenance items and standards/adjustments, and provides ways to correct image faults and operation faults.

The contents of this manual may be updated from time to time to reflect improvements rendered to the copier; a Service Information Bulletin will be issued as necessary to cover major changes.

All service persons are expected to be thoroughly familiar with the information contained in this manual and Service Information Bulletins for quick response to the user's needs.

CANON COLOR LASER COPIER 700/800 REV.2 NOV. 1996 PRINTED IN JAPAN (IMPRIME AU JAPON)

System Configuration


RDF-E1
Staple Sorter F1
Sorter D1
Film Projector A1
Buffer Pass Unit 1
Control Card V
Document Tray C1
Rotary Changer-A1
Film Scanner-3
Editor F1
Editor-F1 Separating Kit
PS-IPU/PS-IPU III
IPU/IPU II
PS-XJ/IPU-10S
Computer

If an IP-I/F PCB or IP-ED PCB is installed, the copier may be connected to such peripheral devices as a host computer, Film Scanner, and Film Scanner-III via PS-IPU/PS-IPUIII, IPU/IPUII, PS-XJ.

CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

I. FEATURES 1-1
II. SPECIFICATIONS 1-2
III. ▲LASER AND SAFETY MEASURES 1-8
IV. NAMES OF PARTS 1-10
V. OPERATIONS 1-17

CHAPTER 2 COPYING PROCESS

I. IMAGE FORMATION 2-1
II. AUXILIARY PROCESS 2-9
III. LIMITATIONS 2-10

CHAPTER 3 OPERATIONS AND TIMING

I. BASIC OPERATION 3-1
II. ORIGINAL EXPOSURE SYSTEM 3-33
III. IMAGE PROCESSING SYSTEM 3-41
IV. LASER EXPOSURE SYSTEM 3-65
V. IMAGE FORMATION SYSTEM 3-69
VI. PICK-UP/FEEDING SYSTEM 3-115
VII. CONTROL PANEL 3-176
VIII. EDITOR 3-178
IX. FANS 3-182
X. POWER SUPPLY 3-185
XI. SERVICE MODE 3-188
XII. SELF DIAGNOSIS 3-293

CHAPTER 4 MECHANICAL SYSTEM

I. EXTERNALS 4-1
II. DRIVE SYSTEM 4-15
III. FEEDING SYSTEM 4-35
IV. EXPOSURE SYSTEM 4-70
V. CHARGING SYSTEM 4-73
VI. DEVELOPING SYSTEM 4-80
VII. FIXING SYSTEM 4-88
VIII. DUPLEXING UNIT 4-97
IX. ELECTRICAL SYSTEM 4-103
X. EDITOR 4-108
XI. OTHERS 4-110
XII. STANDARDS AND ADJUSTMENTS .. 4-119

CHAPTER 5 INSTALLATION

I. SELECTING THE SITE OF INSTALLATION 5-1
II. INSTALLING THE MACHINE 5-2
III. RELOCATING THE MACHINE 5-22
IV. INSTALLING THE ORIGINAL TRAY 5-26
V. INSTALLING THE CONTROL CARD-V 5-27
VI. INSTALLING THE DRUM HEATER...... 5-29
VII. INSTALLING THE CASSETTE HEATER (CLC700) 5-36
VIII. INSTALLING THE CASSETTE HEATER (CLC800) 5-39

CHAPTER 6 MAINTENANCE AND SERVICING

I. PERIODICALLY REPLACED PARTS .. 6-1
II. DURABLES AND CONSUMABLES 6-2
III. PERIODICAL SERVICING 6-5
IV. PERIODICAL SERVICING CHART 6-6

APPENDIX

A. GENERAL TIMING CHART A-1
B. LIST OF SIGNAL AND ABBREVIATIONS A-3
C. GENERAL CIRCUIT DIAGRAM A-9
D. DC CONTROLLER CIRCUIT DIAGRAM A-13
E. READER CONTROLLER CIRCUIT DIAGRAM A-56
F. MAIN POWER SUPPLY CIRCUIT DIAGRAM A-69
G. ANALOG PROCESSOR CIRCUIT DIAGRAM A-74
H. DEVELOPING BIAS CIRCUIT DIAGRAM A-79
I. LASER CINTROLLER CIRCUIT DIAGRAM A-85
J. CCD/CCD DRIVER CIRCUIT DIAGRAM A-89
K. HVT CIRCUIT DIAGRUM A-93
L. CONTROL PANEL RELAY CIRCUIT DIAGRAM A-96
M. TENKEY CIRCUIT DIAGRAM A-98
N. TRANSFER DRIVER CIRCUIT DIAGRAM A-100
O. BD CIRCUIT DIAGRAM...................... A-101
P. ENVIRONMENT MEASURING SIRCUIT DIAGRAM A-102
Q. SPECIAL TOOLS................................ A-103
R. SOLVENTS AND OILS LIST A-105

CHAPTER 1

GENERAL DESCRIPTION

I. FEATURES 1-1
II. SPECIFICATIONS 1-2
III. ▲ LASER AND SAFETY MEASURES . 1-8
IV. NAMES OF PARTS 1-10
V. OPERATIONS 1-17

I. FEATURES

1. New engine and new image processing systems promise high-quality images and faithful reproduction of colors.

The use of a large-diameter drum and a fixed development method, new image processing technology, new transfer method, and a microscopic laser beam bring about stable image quality and accurate reproduction of colors.

2. Ease of operation on a large-sized liquid crystal display panel.

A full body of know-how on how to create full-color copies is ready at hand on a large-size liquid crystal display panel so that the operator can expect to obtain high-quality images regardless of his/her knowledge or skill in color reproduction.

3. Automatic duplexing mechanism.

The CLC800 is equipped with an automatic duplexing mechanism. (Thick paper may be used for two-sided copies by feeding it through the multifeeder; in the case of the CLC700, two-sided copies may be made in the manual mode.)

4. A variety of creative functions.

The copier provides a variety of features for those with a creative mind: its color creation mechanisms include fine-adjustment of hues, chroma, and density, adjustment of color balance; in addition, the copier offers a number of one-touch adjustment controls; its image creation mechanisms include texture processing, image repeating, and mirror imaging; its image processing/editing mechanisms include highlight processing, character processing, and coloring.

II. SPECIFICATIONS

A. Type

Body	Console
Copyboard	Fixed
Light source	Halogen lamp (235 W)
Lens	Lens array
Image reading	Photocells (BGR 3-line CCD); with CCD fixed, by mirror scanning
Photosensitive medium	OPC drum

B. System

Reproduction	Laser beam indirect electrostatic reproduction
Charging	Corona
Exposure	Laser beam
Contrast adjustment	Automatic
Development	Projection and brush (M, C, Y, Bk)
Toner supply	Manual (345 g/bottle)
Pick-up	2 special front loading cassettes and multifeeder (CLC700); 3 special front loading cassettes and multifeeder (CLC800)
Retention	Static retention (gripperless)
Transfer	Brush (transfer sheet)
Separation	Claw and push-up spacer (separation corona assembly as auxiliary)
Cleaning	Blade
Fixing	Heat roller (U, 600 W; L; 600 W)

C. Performance

Type of original		Sheet, book, 3-D object (2 kg/4.4 lb max.)	
Maximum original size		A3 (297 x 420 mm)/Ledger (11" x 17")	
Reproduction ratio		Default: DIRECT (±0.5%), others (±1.0%; see Table 1-1) Zoom: 25% to 400% (±1.0%)	
Wait time (20°C/68°F)		8 min (approx.) 3 min (approx.; in pre-heat mode)	
First copy time (A4/LTR)		Without original detection scanning	28 sec (approx.; full color)
Continuous copying		100 copies (max.)	
Copying speed		See Table 1-2.	
Copy size	Cassette	Max.: A3 (297 x 420 mm)/Ledger (11" x 17") Min.: B5R (182 x 257 mm)/LetterR (8.5" x 11")	
	Multifeeder	Max.: 297 x 432 mm (11.7" x 17") Min.: 182 x 257 mm (7.16" x 10.11")	
Type of copy paper	Cassette	Plain paper (80 to 105 g/m^2), transparency (special)	
	Multifeeder	Postcard (special), thick paper (106 to 163 g/m^2), label sheet (special)	
	Two-sided copy (CLC800 only)	Plain paper (90 to 105 g/m^2)	
Cassette		Clawless, center reference; 55 mm/2.17 in deep (about 500 sheets of 80 g/m^2 paper)	
Delivery tray		100 sheets (approx. of 80 g/m^2 paper)	
Copy margin		One-sided	Two sided
		Leading edge: 8.0 ± 1.5 mm Trailing edge: 2.5 ± 1.5 mm Left/right: 2.0 ± 1.0 mm	8.0 ± 2.0 mm 2.5 ± 1.5 mm 2.0 ± 1.5 mm (4.5 ±1.5 mm for one side of a two-sided copy or in manual mode)
Non-image width		Leading edge: 8.0 ± 1.5 mm Trailing edge: 4.5 mm Left/right: 2.0 ± 1.0 mm	8.0 ± 2.0 mm 4.5 mm 2.0 ± 1.5 mm
Main scanning direction		400 DPI (dots per inch; 15.7 dots/mm)	
Sub scanning direction		400 LPI (lines/in; 15.7 lines/mm)	
Auto clear		Provided (2 min standard; may be changed or disabled in user mode)	

Auto color selection	Provided (distinguishes between color and black-and-white originals to select 4-color/black-mono copying)
AE	Provided
Auto paper selection	Provided
Auto zoom	Provided
One-touch adjustment	Provided
Color adjustment	Provided (color balance, chroma adjustment, hue adjustment)
Auto shutoff	Provided
Marker designation	Provided (requires IP-ED Board)
Original mode	Provided (text/photo, text, photo, map)
Frame erasing	Provided
Auto gradation correction	Provided
Option	Film Projector, CCV, IPU-2, IPU10/10S*, IPU II, PS-IPU, PS-IPU III, Film Scanner-3, RDF, Sorter

* Connection requires replacement of the IPU10/10S's ROM, making it a CLC700/800-specific IPU10/10S.

D. Others

<table>
<tr><td colspan="2">Operating environment</td><td colspan="2">Temperature: See Figure 5-1.
Humidity: See Figure 5-1.
Atmospheric pressure: 0.8 to 1 atm; 810.6 hPa to 1013.3 hPa)</td></tr>
<tr><td colspan="2">Power supply (voltage ±10%)</td><td colspan="2">
<table>
<tr><td>Model</td><td colspan="2">CLC700</td><td colspan="2">CLC800</td></tr>
<tr><td>TYPE</td><td>TYPE1</td><td>TYPE2</td><td>TYPE1</td><td>TYPE2</td></tr>
<tr><td>115V (TWN)</td><td>NCN xxxx</td><td>NKN xxxx</td><td>NCT xxxx</td><td>NKT xxxx</td></tr>
<tr><td>115V (USA)</td><td>NCL xxxx</td><td>NKL xxxx</td><td>NCS xxxx</td><td>NKS xxxx</td></tr>
<tr><td>230V (KOR)</td><td>———</td><td>PKR xxxx</td><td>———</td><td>———</td></tr>
<tr><td>230V (Others)</td><td>PCN xxxx</td><td>PKN xxxx</td><td>PCS xxxx</td><td>PKS xxxx</td></tr>
<tr><td>230V (UK)</td><td>QCQ xxxx</td><td>QKQ xxxx</td><td>QCS xxxx</td><td>QKS xxxx</td></tr>
<tr><td>230V (CA)</td><td>RCQ xxxx</td><td>RKQ xxxx</td><td>RCS xxxx</td><td>RKS xxxx</td></tr>
<tr><td>230V (FRN)</td><td>SCR xxxx</td><td>SKR xxxx</td><td>SCS xxxx</td><td>SKS xxxx</td></tr>
<tr><td>230V (GER)</td><td>TCR xxxx</td><td>TKR xxxx</td><td>TCS xxxx</td><td>TKS xxxx</td></tr>
<tr><td>230V (AMS)</td><td>UCR xxxx</td><td>UKR xxxx</td><td>UCS xxxx</td><td>UKS xxxx</td></tr>
</table>
TYPE1 and TYPE2 models may be identified by machine serial numbers.</td></tr>
<tr><td colspan="2">Power consumption</td><td colspan="2">Maximum: 1.5 kW or less
Copying: 0.75 kW/h or less (A4, full-color, continuous; reference only)
Standby: 0.29 kW/h (pre-heat off; reference only)</td></tr>
<tr><td colspan="2">Noise</td><td>71 dB (copying)
50 dB (standby)
Measured at a point 1 m from the machine.</td><td>Sound power level as measured by the ISO method</td></tr>
<tr><td colspan="2">Ozone</td><td colspan="2">0.02 ppm or less (average over 8 hr)</td></tr>
<tr><td rowspan="2">Consumables</td><td>Paper</td><td colspan="2">Keep paper wrapped to protect against humidity.</td></tr>
<tr><td>Toner</td><td colspan="2">Protect from sunshine; keep at 40°C/105°F or less.</td></tr>
<tr><td colspan="2">Dimensions</td><td colspan="2">Width: 755 mm/29.7 in.
Depth: 770 mm/30.3 in.
Height: 1000 mm/39.4 in.</td></tr>
<tr><td colspan="2">Weight</td><td colspan="2">253 kg (CLC700 only)
281 kg (CLC800 only)
3.7 kg (copyboard cover)
4.9 kg (editor)</td></tr>
</table>

Country	Reduction		Enlargement	
Japan, Australia, others (6R5E)		0.250	B4 → A3 B5R → A4R B5 → A4	1.153
	A3 → A4R B4 → B5R	0.707		
	B4 → A4R	0.815	A4R → B4, A5 → B5	1.223
	A3 → B4 A4R → B5R	0.865	A4R → A3 B5R → B4	1.414
		0.500	A5 → A3	2.000
	A3 → B5	0.611		4.000
North America (5R4E)		0.250	LGL → 11" x 17"	1.214
		0.500	LTRR → 11" x 17"	1.294
	11" x 17" → LTRR	0.647	MINIT → LTRR	2.000
	11" x 17" → LGL	0.733	MINIR → 11" x 17"	4.000
	LGL → LTRR	0.786		
Europe (3R3E)		0.250	A4R → A3	1.414
	A3 → A4R	0.707	A5 → A3	2.000
		0.500		4.000

Table 1-201 Default Reproduction Ratios

Copy size	4-color (YMCBk)	Mono-color (YMCBk)
A3	3.53	14.11
B4	3.53	14.11
A4-R	3.53	14.11
B5-R	3.53	14.11
A4	7.06	28.22
B5	7.06	28.22
11" x 17"	3.53	14.11
LGL	3.53	14.11
LTR-R	3.53	14.11
LTR	7.06	28.22

Table 1-202 Copying Speed (copies/min)

Specifications subject to change without notice.

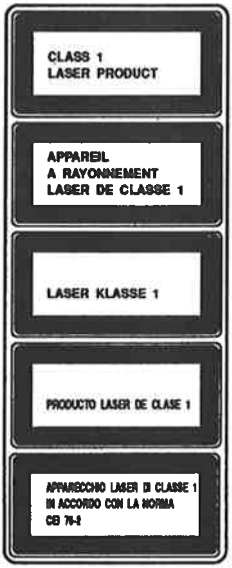
NOTICE:
This copier is equipped with a Counterfeit Protection System.

III. ▲LASER AND SAFETY MEASURES

A. DHHS

The CLC700/800 has been approved as Class 1 equipment under the Radiation Performance Standards of the Department of Health and Human Services (DHHS), established in the U.S.A. in 1968.

The approval represents that the product has shown to be free of harmful laser beams; the optical system of the product is designed such that the laser beams are confined in a protective housing and cannot escape the product while in use.



CLASS 1
LASER PRODUCT

APPAREIL
A RAYONNEMENT
LASER DE CLASSE 1

LASER KLASSE 1

PRODUCTO LASER DE CLASE 1

APPARECCHIO LASER DI CLASSE 1
IN ACCORDO CON LA NORMA
CEI 76-2

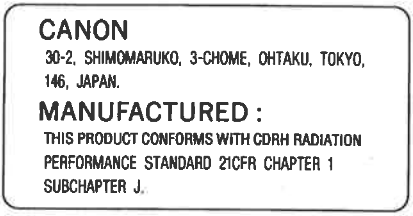
Figure 1-1

B. CDRH

On August 2, 1976, the Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration of the U.S.A. put an act in force to deal with laser devices.

Under the act, laser devices manufactured on and after August 1, 1976, may not be marketed in the United States without approval.

Figure 1-2 shows the label which serves as proof of approval under the act; the label is required to be attached to all laser devices marketed in the U.S.A.



CANON
30-2, SHIMOMARUKO, 3-CHOME, OHTAKU, TOKYO,
146, JAPAN.
MANUFACTURED :
THIS PRODUCT CONFORMS WITH CDRH RADIATION
PERFORMANCE STANDARD 21CFR CHAPTER 1
SUBCHAPTER J.

Figure 1-2

Note:
The description may vary from product to product.

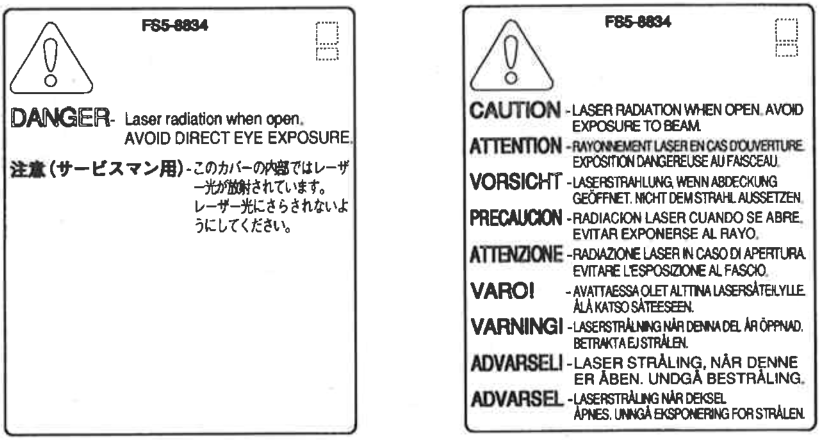
C. Points to Note When Handling the Laser Unit

When servicing the optical unit of the product, take adequate care not to interrupt the laser path with a tool having a high reflectance.

As a rule, remove the watch, rings, or the like before work; such items tend to reflect the beam and damage the eyes.

Remain alert when servicing inside the covers on which the label is attached.

The machine is equipped with a shutter which blocks out the laser beam when the front left door is opened; therefore, when images are checked with the front left door open, the shutter needs to be held open using a door switch actuator. Keep these in mind when such work is necessary.



FS5-8834

DANGER- Laser radiation when open.
AVOID DIRECT EYE EXPOSURE.

注意（サービスマン用）- このカバーの内部ではレーザー光が放射されています。レーザー光にさらされないようにしてください。

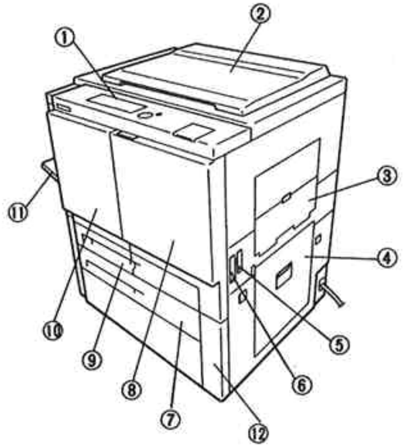
FS5-8834

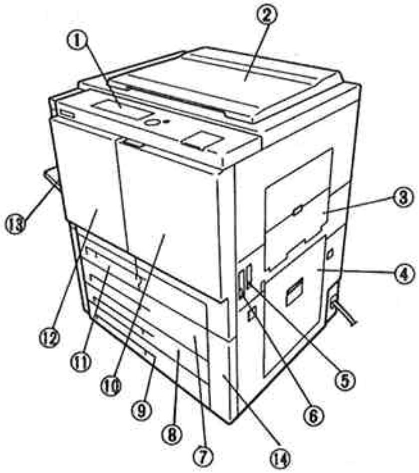
CAUTION - LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ATTENTION - RAYONNEMENT LASER EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.
VORSICHT - LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
PRECAUCION - RADIACION LASER CUANDO SE ABRE. EVITAR EXPONERSE AL RAYO.
ATTENZIONE - RADIAZIONE LASER IN CASO DI APERTURA. EVITARE L'ESPOSIZIONE AL FASCIO.
VARO! - AVATTAESSA OLET ALTTINA LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING! - LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.
ADVARSEL! - LASER STRÅLING, NÅR DENNE ER ÅBEN. UNDGÅ BESTRÅLING.
ADVARSEL - LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN.

Figure 1-3

IV. NAMES OF PARTS

A. External View



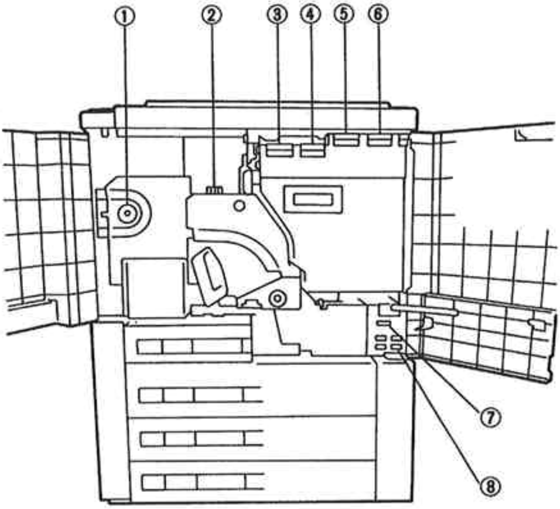


①	Control panel
②	Copyboard cover
③	Multifeeder
④	Pick-up door
⑤	Control key
⑥	Power switch
⑦	Cassette 2
⑧	Front right door
⑨	Cassette 1
⑩	Front left door
⑪	Copy tray
⑫	Servicing documents compartment

Figure 1-4 (CLC700)

①	Control panel
②	Editor
③	Multifeeder
④	Pick-up door
⑤	Control key
⑥	Power switch
⑦	Duplexing unit
⑧	Cassette 3
⑨	Cassette 4
⑩	Front right door
⑪	Cassette 1
⑫	Front left door
⑬	Copy tray
⑭	Servicing documents compartment

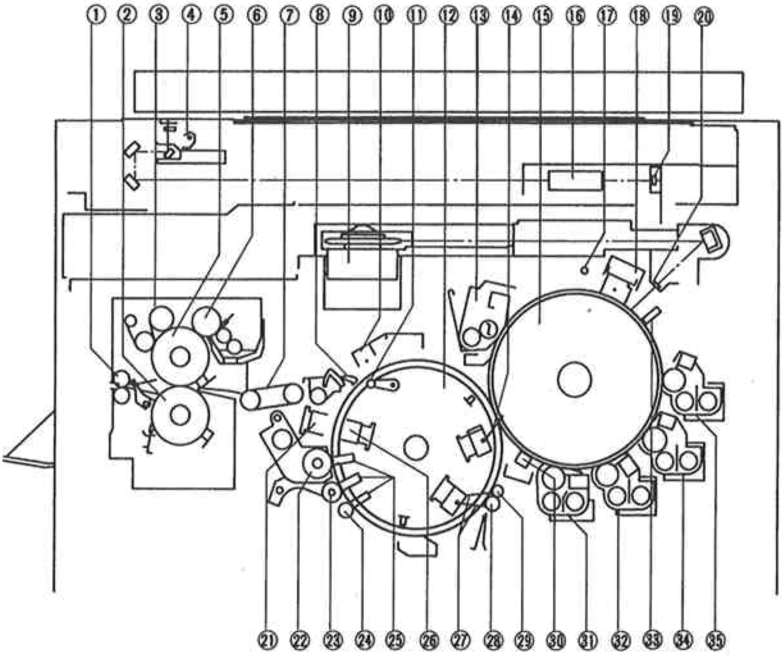
Figure 1-5 (CLC800)



①	Fixing assembly knob
②	Front left door switch
③	Bk toner supply mouth
④	M toner supply mouth
⑤	C toner supply mouth
⑥	Y toner supply mouth
⑦	Front right door switch
⑧	Counter

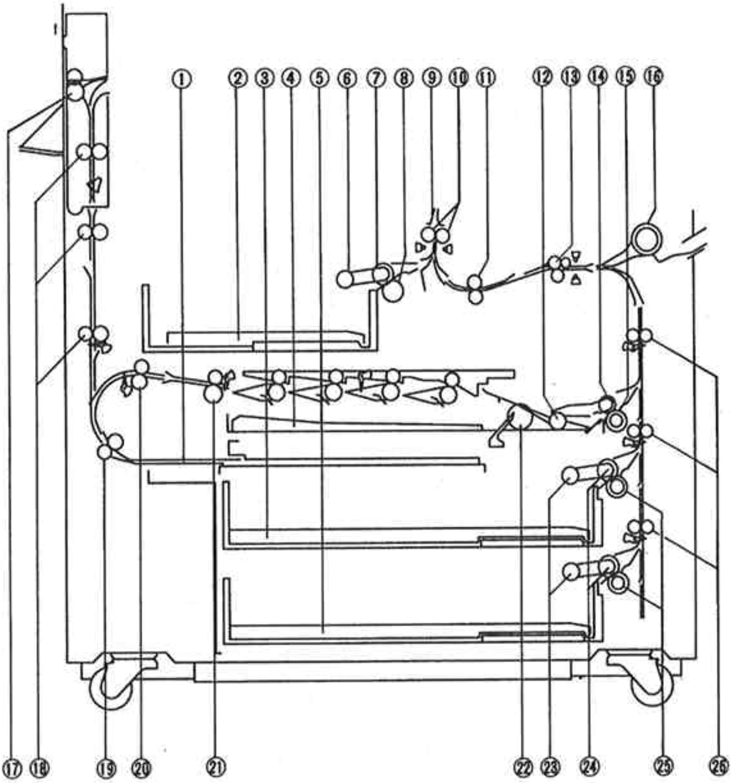
Figure 1-6 (CLC800)

B. Cross Section



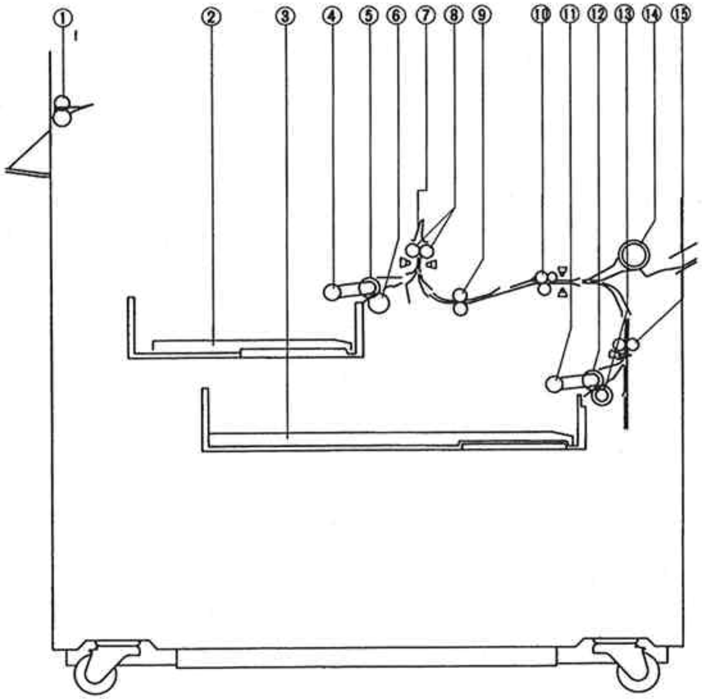
① Inside delivery roller
② Lower fixing roller
③ Cleaning belt
④ Scanning lamp
⑤ Upper fixing roller
⑥ Oil application roller
⑦ Feed belt
⑧ Separation claw
⑨ Laser scanner
⑩ Separation corona assembly
⑪ Separation push-up spacer
⑫ Transfer drum
⑬ Photosensitive drum cleaner
⑭ Transfer brush
⑮ Photosensitive drum
⑯ Lens
⑰ Pre-exposure lamp
⑱ Primary corona assembly
⑲ CCD
⑳ Dust proof glass
㉑ External static eliminator
㉒ Transfer drum cleaner
㉓ Transfer oil removing roller
㉔ Transfer polishing roller
㉕ Transfer push-on brush
㉖ Internal static eliminator
㉗ Retention brush
㉘ Retention roller
㉙ Retention smoothing roller
㉚ Black toner density sensor
㉛ Black developing assembly
㉜ Magenta developing assembly
㉝ Potential sensor
㉞ Cyan developing assembly
㉟ Yellow developing assembly

Figure 1-7 (CLC700/CLC800)



①	Duplexing unit reversing assembly
②	1st cassette holder
③	2nd cassette holder
④	Duplexing stacking assembly
⑤	4th cassette holder
⑥	Cassette 1 pick-up roller
⑦	Cassette 1 feeding roller
⑧	Cassette 1 separation roller
⑨	Retention guide
⑩	Registration roller
⑪	Pre-registration roller 1
⑫	Duplexing pick-up roller
⑬	Pre-registration roller 2
⑭	Duplexing feeding roller
⑮	Duplexing separation roller
⑯	Multifeeder pick-up roller
⑰	External delivery roller
⑱	Delivery vertical path roller
⑲	Duplexing reversing assembly inlet roller
⑳	Duplexing reversing assembly feeding roller
㉑	Duplexing reversing assembly outlet roller
㉒	Duplexing unit feeding roller
㉓	Cassette 3/4 pick-up roller
㉔	Cassette 3/4 feeding roller
㉕	Cassette 3/4 separation roller
㉕	Cassette 3/4 separation roller
㉖	Pick-up vertical path roller

Figure 1-8 (CLC800)



①	External delivery roller
②	1st cassette holder
③	2nd cassette holder
④	Cassette 1 pick-up roller
⑤	Cassette 1 feeding roller
⑥	Cassette 1 separation roller
⑦	Retention guide
⑧	Registration roller
⑨	Pre-registration roller 1
⑩	Pre-registration roller 2
⑪	Cassette 2 pick-up roller
⑫	Cassette 2 feeding roller
⑬	Cassette 2 separation roller
⑭	Multifeeder pick-up roller
⑮	Pick-up vertical path roller

Figure 1-9 (CLC700)

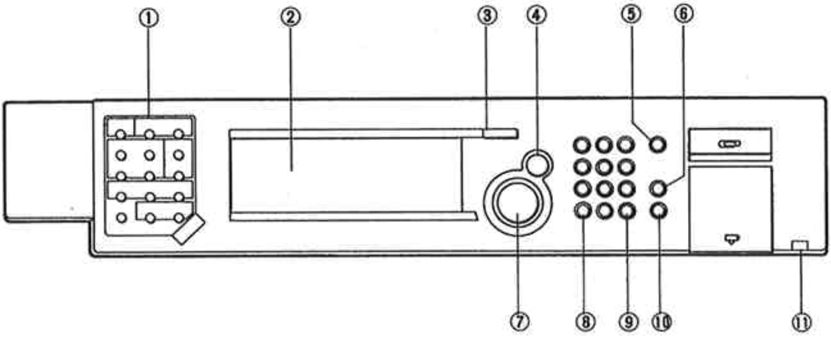


Figure 1-10

Key	Operation/function	Remarks
① Extended Copy Mode key	Press it when selecting a copy mode.	
② Message display key	Press it to display the current copy mode and settings.	
③ Reset key	Press it to cancel the current copy mode and return to standard mode.	
④ Stop key	Press it to stop continuous copying.	
⑤ Pre-Heat key	Press it to start or end pre-heat mode.	
⑥ Interrupt key	Press it to interrupt the ongoing copying run for making an extra copy.	
⑦ Start key	Press it to start copying operation.	
⑧ Clear key	Press it to change the copy count or settings.	
⑨ ID key	Press it to activate ID mode.	A press activates ID mode, requiring input of an ID for the next copy.
⑩ Call key	Press it to recall any of the most recent three copy modes.	
⑪ Pilot lamp	Comes on (green) when the power is switched on.	

Table 1-301

Instructions to the User

1. You must use manual mode when making two-sided copies (CLC700) or on thick paper (CLC700/800); be sure to reverse the curl on the leading edge of the paper before feeding it for the second time.
2. When stacking transparencies in the cassette, be sure to place paper (thick, for backing) on the bottom of the stack.
3. When stacking transparencies in the cassette or the multifeeder, be sure to separate, as by fanning out, the transparencies before placing the stack.
4. Keep in mind that copy paper may be classified into the following five:
   plain paper: regular copy paper (80 to 105 g/m^2)
   thick paper: copy paper with certain thickness (106 to 157 g/m^2)
   transparency: transparent film used for OHP
   special 1: paper identified by the Special 1 notation on the wrappings
   special 2: paper identified by the Special 2 notation on the wrappings

V. OPERATIONS

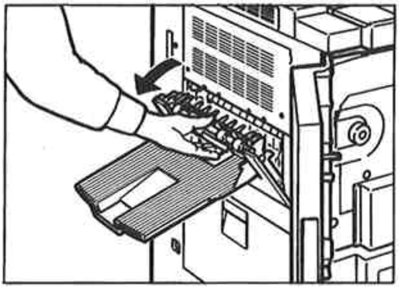
A. Removing jams

If paper jams, remove it as follows:

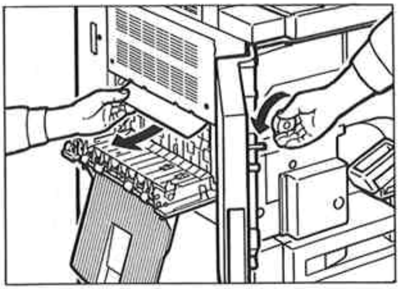
1) Open the front door (left/right).
2) Check all locations identified on the touch panel display, and remove the paper, if any.
3) Shift any levers or close any doors you have moved or opened back into position.
4) Open both left and right front doors once, and close them.

B. Jam behind the Upper Left Door

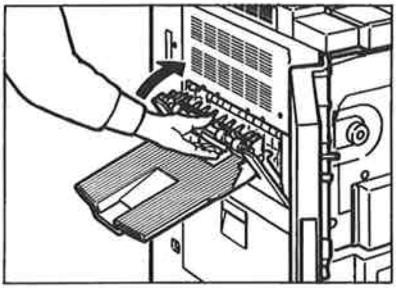
1) Open the front door (left/right).
2) Remove the copy paper from the tray. Then, hold the grip on the body, and slowly open the left door.



3) Turn the knob (green) counterclockwise, and remove the paper from the rear of the delivery assembly.



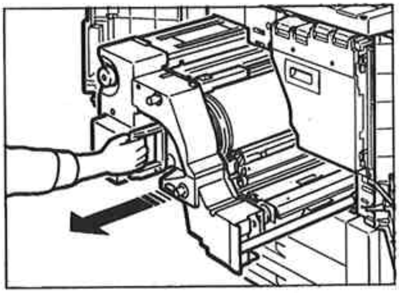
4) After removing the paper, close the left door securely.



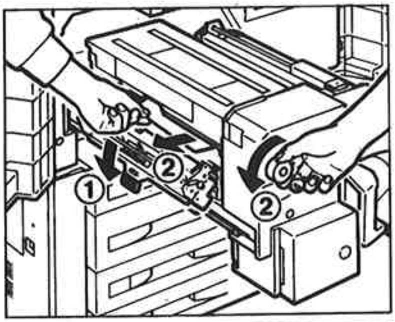
5) Close the front door.

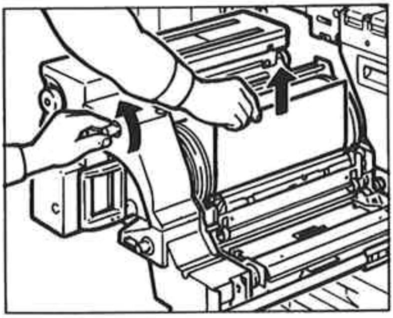
C. Jam behind the Front Door

1) Open the front door (left/right).
2) Shift the lever (green) to the left, and pull it to draw out the transfer assembly frame.

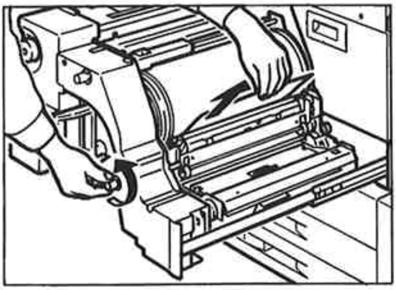


3) Turn the knob (green) counterclockwise, and remove the paper.

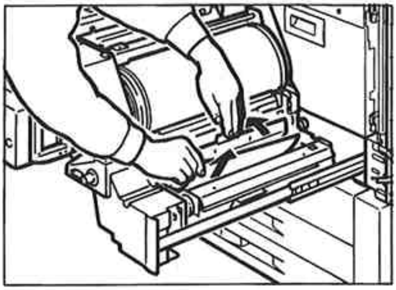




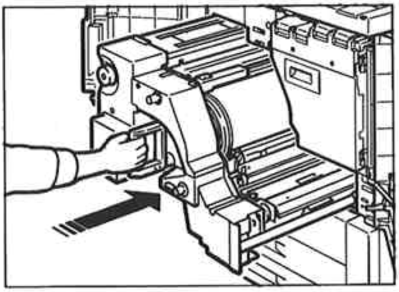
If the paper is trapped deep inside, turn the knob (green) counterclockwise to remove it.

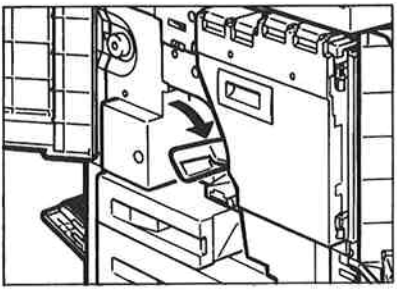


4) Shift the knob (green) up and remove the paper.



5) Push the transfer assembly frame into the copier, and put the lever (green) back into position.

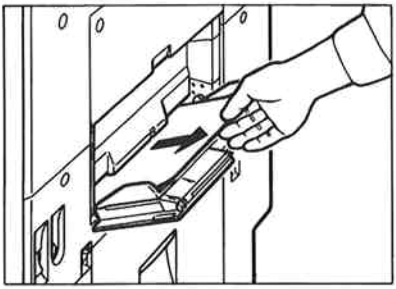




6) Close the front door (left/right).

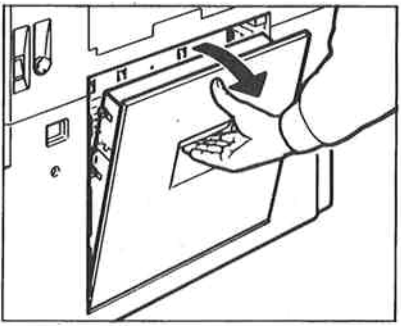
D. Paper in the Multifeeder Assembly

1) Remove the paper set in the multifeeder. Then, remove the paper jammed inside the multifeeder assembly.

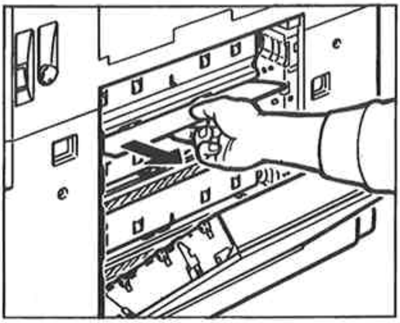


E. Paper Behind the Lower Right Door

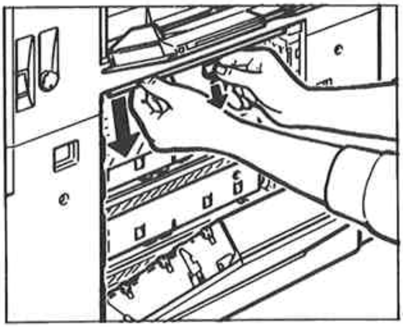
1) Open the right door of the cassette assembly.



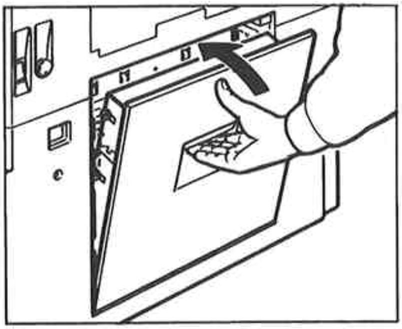
2) Remove the paper.



3) While pushing the grip (green) shown in the figure toward the lower rear, remove the paper.

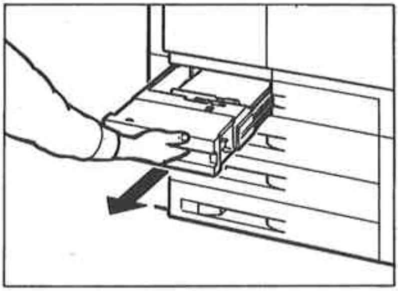


4) Close the right door of the cassette assembly securely.

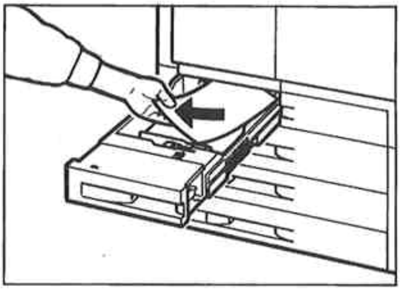


F. Paper in the Cassette Assembly

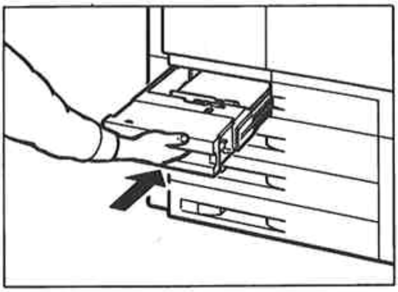
1) Draw out the cassette



2) Remove the paper jammed in the cassette.

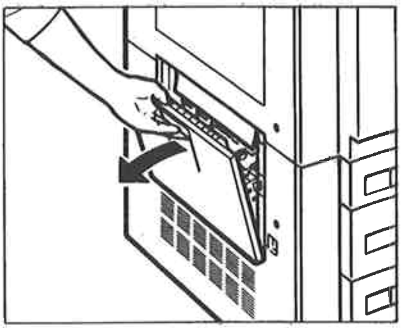


3) Put the cassette back into position.

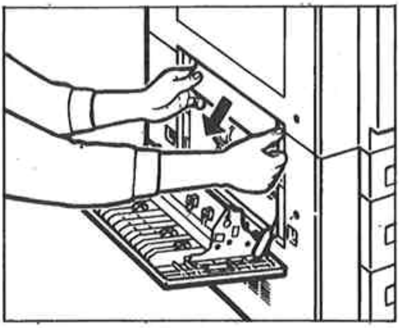


G. Paper behind the Lower Left Door

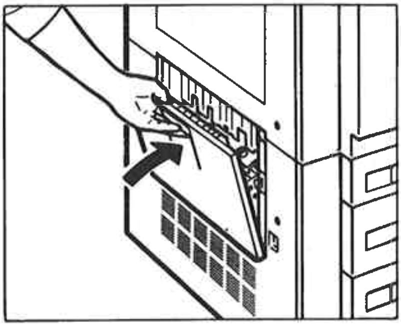
1) Open the lower left door.



2) Remove the paper.

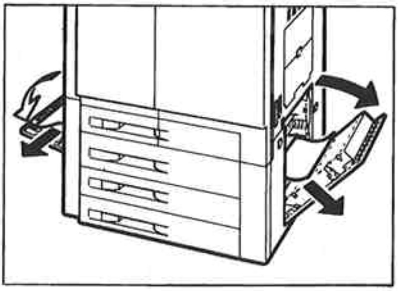


3) Close the lower left door securely.

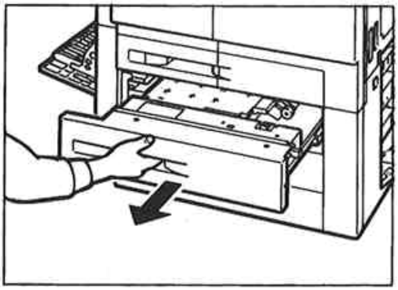


H. Paper in the Duplexing Unit Assembly

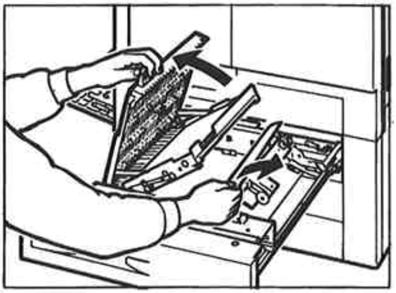
1) Open the bottom door (left/right), and remove any paper.



2) Draw out the duplexing unit.

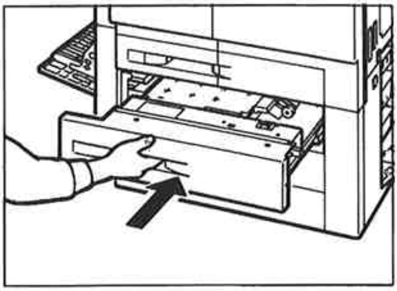


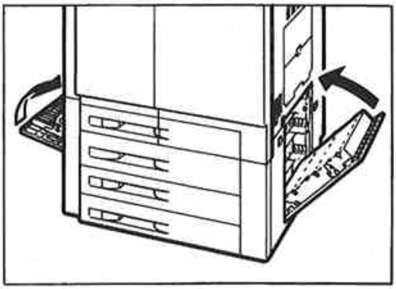
3) Open the cover shown in the figure, and remove the paper.



If any paper is half way out of the duplexing tray, remove it.

4) Put the duplexing tray back into position, and close the door of the vertical path unit (left/right) securely.

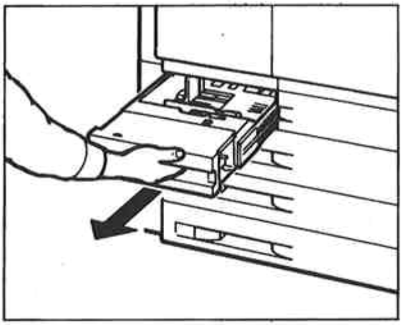




I. Supplying Paper

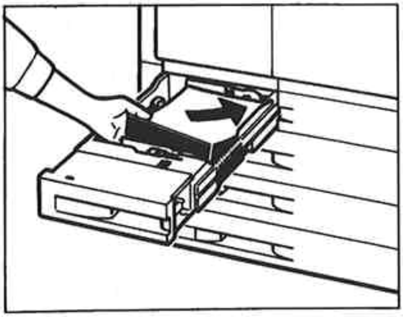
Check the display to find out which unit needs paper, and supply it with paper as follows:

1) Hold the grip on the cassette, and pull it to the front until it stops.



2) Unwrap the copy paper while keeping the following in mind:
   - Each cassette can hold 500 sheets (80 g/m²) of copy paper.
   - Use paper of a type recommended by Canon for the best results.
   - Wrap any remaining paper, and keep it in a place protected from humidity and direct rays of the sun.
   - Do not use any of the following to avoid jams.
     - wrinkled paper, curled paper
     - thin, coarsely processed paper
   - For automatic two-sided copies, paper of 105 g/m² is recommended.

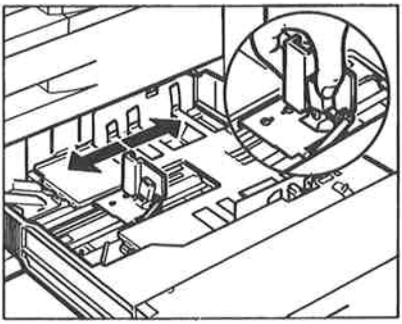
3) Put the stack of paper in the cassette. (Keep in mind that paper has face and back.)



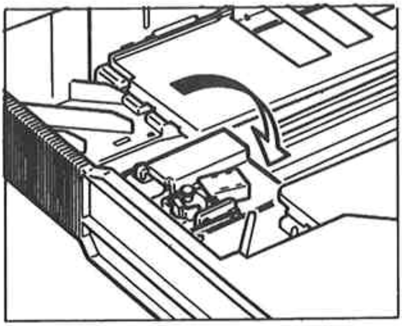
4) Hold the grip on the pick-up cassette, and push it inside the copier until a click is heard.

J. Changing the Cassette Size

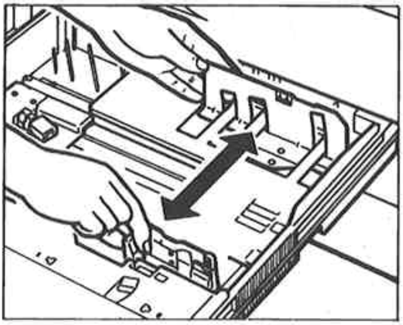
1) Hold the lever as shown in the figure, and slide the length guide to the appropriate length index.



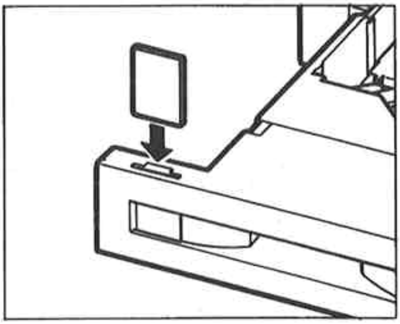
If you are cleaning the paper size to A3, slide the length guide to the left end and shift down the guide to the right.



2) Hold the lever as shown in the figure, and slide the width guide to the appropriate width index.

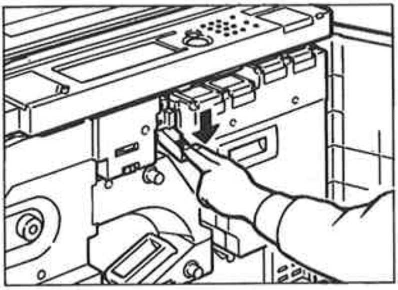


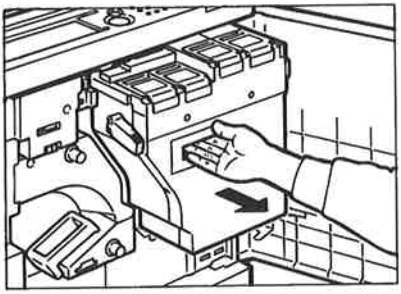
3) Replace the size plate of the cassette to suit the new paper size.



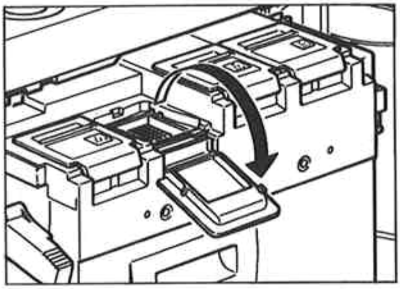
K. Supplying Toner

1) Open the front door.
2) Push down the lever, and draw out the hopper unit.

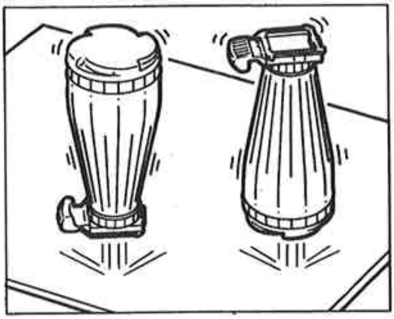




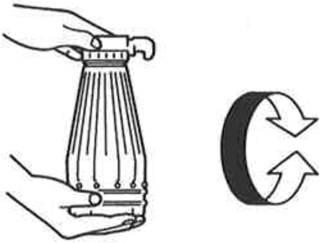
3) Open the lid on the toner supply mouth whose color is the same as the toner to be supplied.



4) While keeping its mouth at the bottom, drop the toner bottle about five times to a firm surface (desk) from a height of about 3 cm.
Then, turn over the toner bottle, and drop it about five times in the same way.

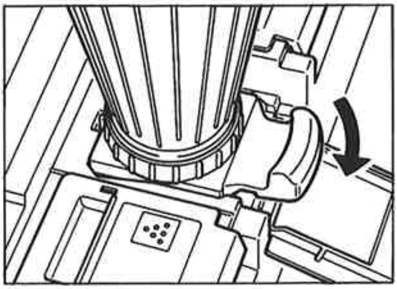


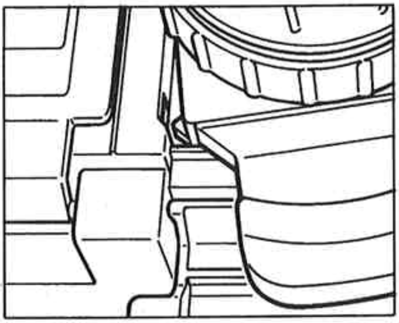
5) Hold the toner bottle with both hands, keep turning it upside down and back about 20 times.

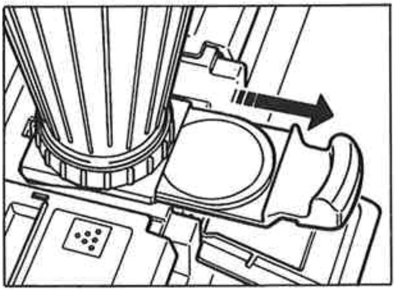


6) Fit the mouth of the toner bottle over the toner supply mouth, then turn the toner bottle clockwise until it is securely in place.

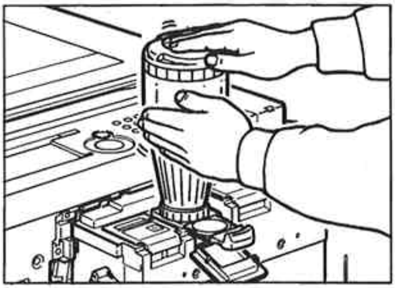
Check that the claw of the bottle is engaged with the supply mouth and the bottle is securely in place; then, pull the shutter.



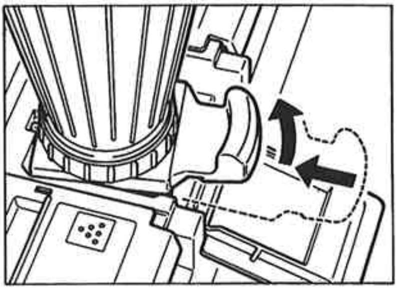




7) Lightly tap the bottom and sides of the toner bottle two to three times to make sure that all toner is out the bottle and in the hopper.



8) Close the shutter, and turn the toner bottle counterclockwise; then, lift the toner bottle slowly.

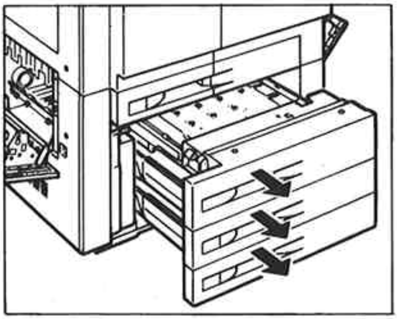


9) Close the lid of the supply mouth, and push the hopper unit back into position; then, close the front door.

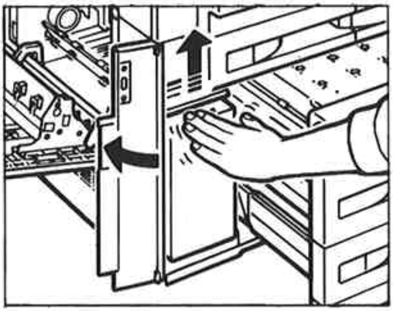
L. Collecting Waste Toner

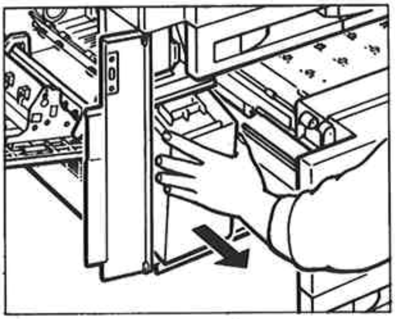
Replace the collection container with a new one as follows:

1) Open the bottom door (left/right)
2) Draw out the cassette and two-sided unit.

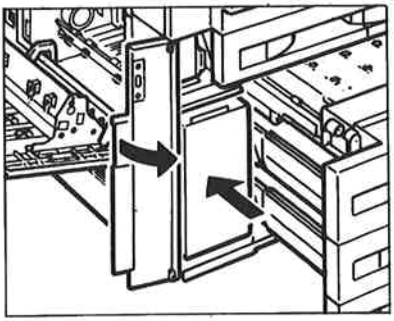


3) Open the cover in front of the waste toner container; then, while shifting up the lever, slide out the container that has become full with toner.





4) Set an empty waste toner collection container, and close the cover.



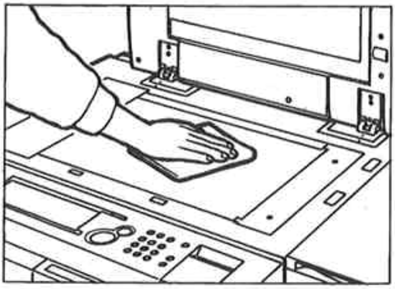
5) Put the cassette, duplexing unit, and lower door into original position.

M. Routine Maintenance

Advise the user to clean the following parts about once a week or when copies become soiled.

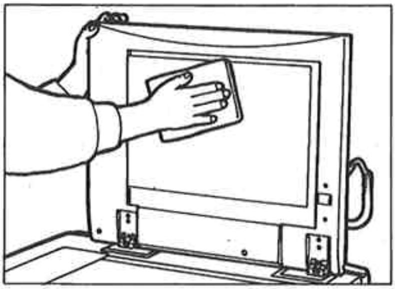
- Copyboard Glass

Wipe the glass with a cloth moistened with water or mild detergent, and dry wipe it.



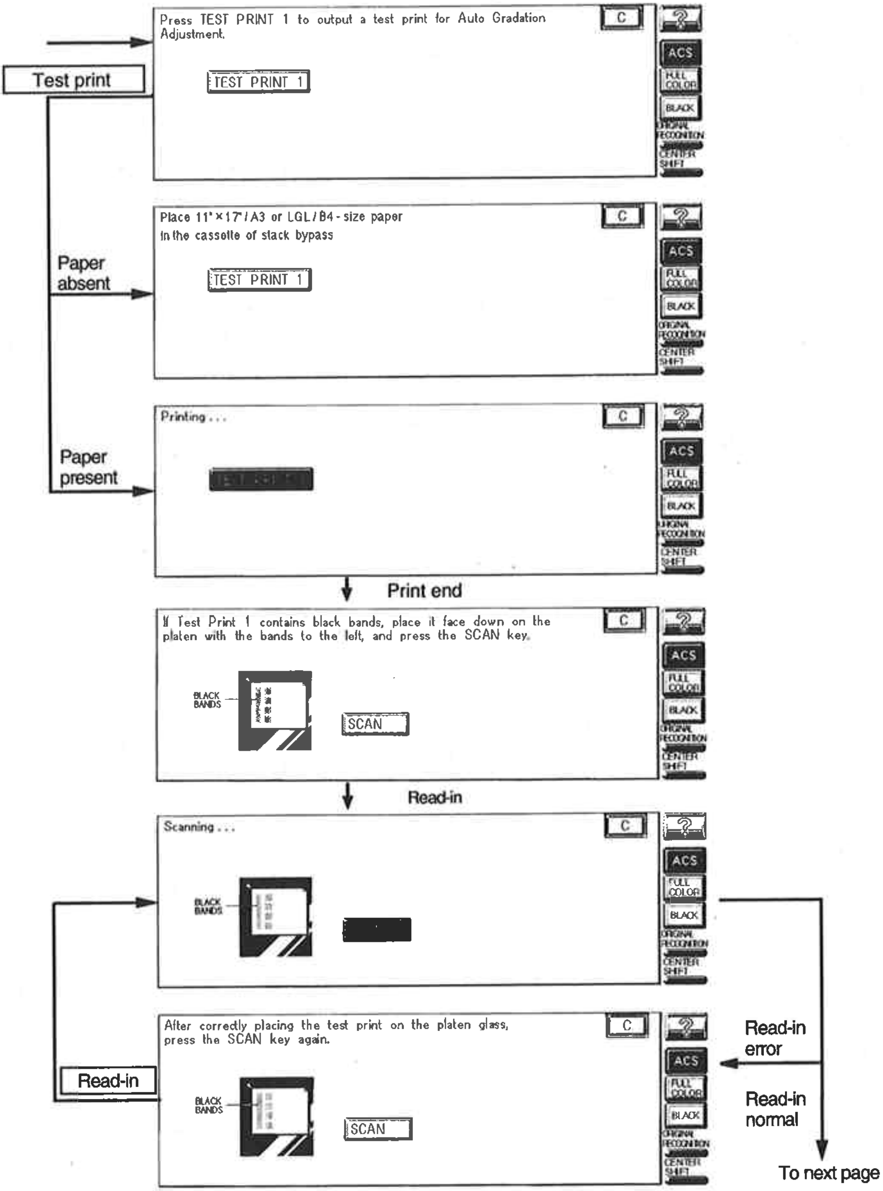
- Copyboard Cover

Wipe the sheet with a cloth moistened with water or mild detergent, and dry wipe it.



N. Using Automatic Gradation Correction

Press the User mode (*) key, and select 'automatic gradation correction'; then, follow the following instructions.



Press TEST PRINT 1 to output a test print for Auto Gradation Adjustment.

Place 11"×17"/A3 or LGL/B4-size paper in the cassette of stack bypass

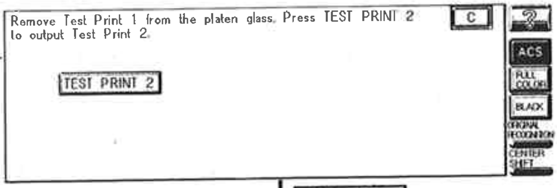
Printing . . .

If Test Print 1 contains black bands, place it face down on the platen with the bands to the left, and press the SCAN key.

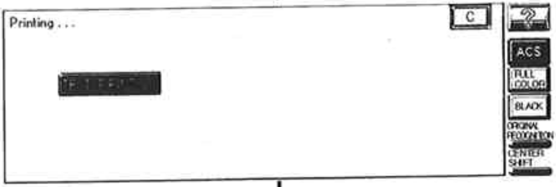
Scanning . . .

After correctly placing the test print on the platen glass, press the SCAN key again.

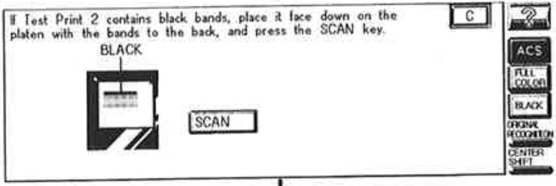
Test print
TEST PRINT 1
C
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT
Paper absent
Paper present
Print end
BLACK BANDS
SCAN
Read-in
Read-in error
Read-in normal
To next page


Remove Test Print 1 from the platen glass. Press TEST PRINT 2 to output Test Print 2.
C
?
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT
TEST PRINT 2

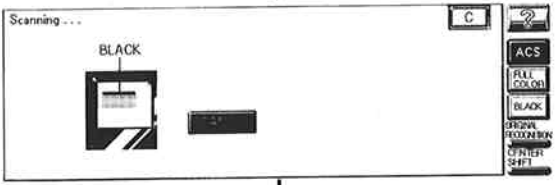
Test print 2


Printing . . .
C
?
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT

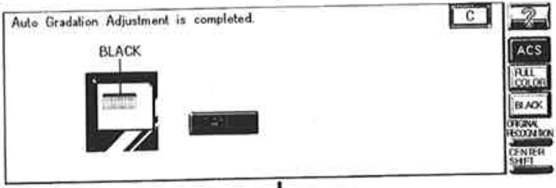
Print end


If Test Print 2 contains black bands, place it face down on the platen with the bands to the back, and press the SCAN key.
C
?
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT
BLACK
SCAN

Read-in


Scanning . . .
C
?
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT
BLACK

Read-in end


Auto Gradation Adjustment is completed.
C
?
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT
BLACK

The User Mode screen returns to end the session.

CHAPTER 2

COPYING PROCESS

I. IMAGE FORMATION 2-1
II. AUXILIARY PROCESS 2-9
III. LIMITATIONS 2-10

I. IMAGE FORMATION

A. Outline

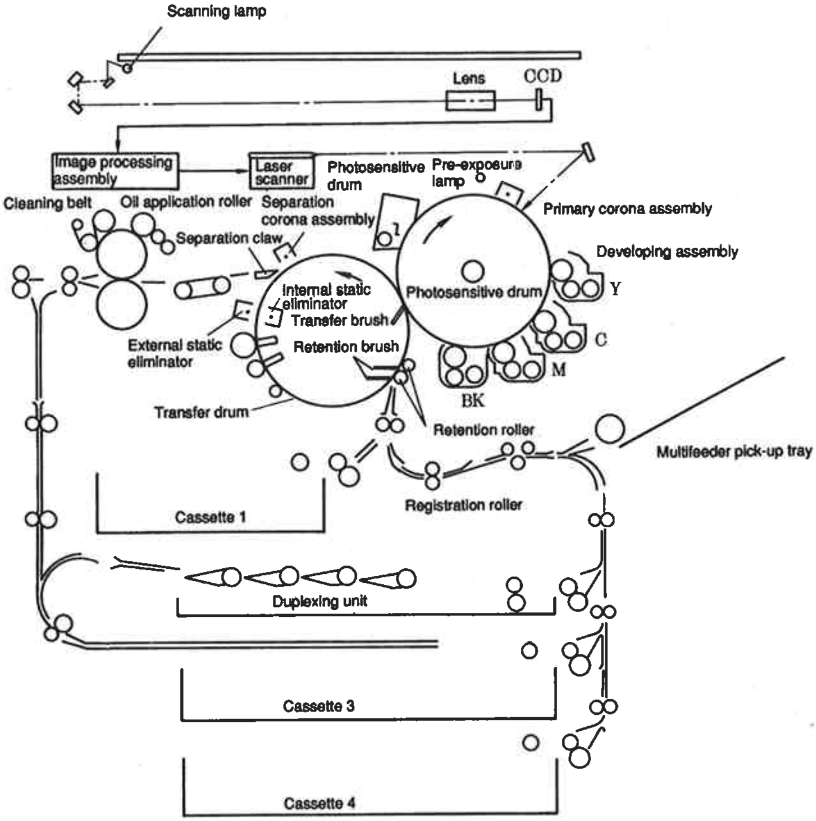

Scanning lamp
Lens
CCD
Image processing assembly
Laser scanner
Photosensitive drum
Pre-exposure lamp
Primary corona assembly
Cleaning belt
Oil application roller
Separation corona assembly
Separation claw
Developing assembly
Y
Internal static eliminator
Photosensitive drum
Transfer brush
C
External static eliminator
Retention brush
M
BK
Transfer drum
Retention roller
Multifeeder pick-up tray
Registration roller
Cassette 1
Duplexing unit
Cassette 3
Cassette 4

Figure 2-1

The copier uses a seamless drum as its photosensitive medium; see Figure 2-2 for its construction.

The photosensitive drum consists of a photoconducting outside layer made of photo-conducting material (OPC) and an aluminum base on the inside.

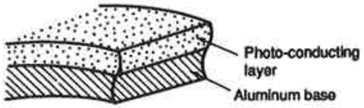


Photo-conducting layer
Aluminum base

Figure 2-2

As opposed to black-and-white copiers, the copier may be characterized by the following:

The copier illuminates a color original, and separates the reflected light into the three primary colors of light by means of filters for identification by CCDs. Based on the data from the CCDs, a laser beam is directed on the photosensitive drum to develop the color* that corresponds to each filter. The process is repeated a maximum of four times, and the resulting image is fixed on paper to produce a color copy.

* Using toner which is complementary to the color of the filter.

The repetition of the process requires retention of copy paper, and a transfer drum is provided in addition to the photosensitive drum for this purpose.

The transfer drum is identical in size with the photosensitive drum; therefore, the photosensitive drum makes a single rotation for each rotation of the transfer drum.

The copier's image formation process can be divided into the following nine steps:

Step 1 Pre-exposure
Step 2 Primary charging (-)
Step 3 Laser exposure
Step 4 Development (AC + DC bias)
Step 5 Retention (-, +)
Step 6 Transfer (-, +)
Step 7 Separation (AC + DC)
Step 8 Photosensitive drum cleaning
Step 9 Fixing

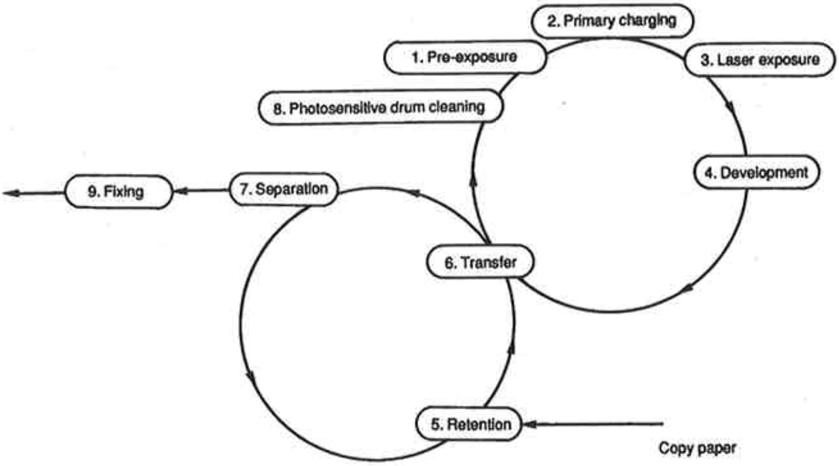

2. Primary charging
1. Pre-exposure
3. Laser exposure
8. Photosensitive drum cleaning
4. Development
9. Fixing
7. Separation
6. Transfer
5. Retention
Copy paper

Figure 2-3

B. Latent Static Image Formation Block

This block consists of three steps, ultimately leaving negative charges in areas of the drum surfaces that represent the white areas of the original and removing negative charges from those areas that represent the black areas of the original.

The image on the drum surface created by the presence/absence of negative charges is not visible to the human eye and, is therefore, called the *latent static image*.

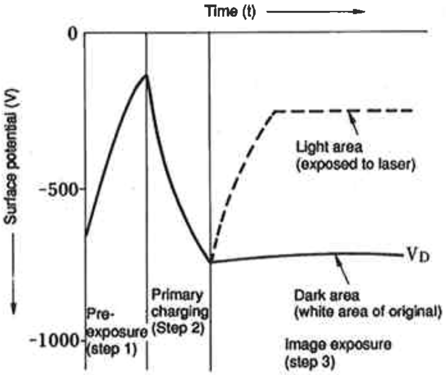


Figure 2-4

C. Pre-Exposure (step 1)

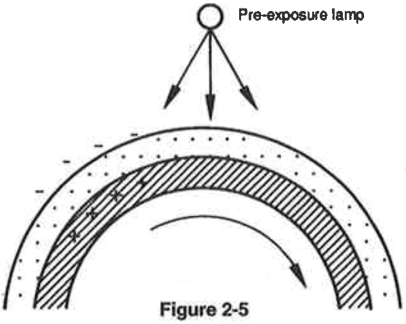


Figure 2-5

Before primary charging is executed, light from the pre-exposure lamp is directed to the drum surface to remove any residual charges from the drum surface, thereby preventing uneven copy density.

D. Primary Charging (step 2)

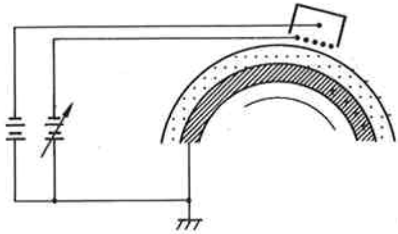


Figure 2-6

The primary corona assembly charges the drum surface with a uniform layer of negative charges to obtain primary potential.

The surface potential of the drum charged this way is determined by the potential of the grid; and, for this reason, a bias is applied to the grid to ensure a stable drum surface potential.

E. Laser Exposure (step 3)

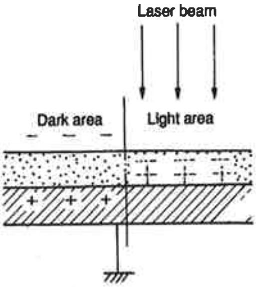


Figure 2-7

A laser beam is directed to the drum surface in such a way that will represent the dark areas of the original, thereby neutralizing the charges on the drum surface. Such areas are called the *light* areas of the photosensitive drum, and will attract toner in step 4 (development).

F. Development (step 4)

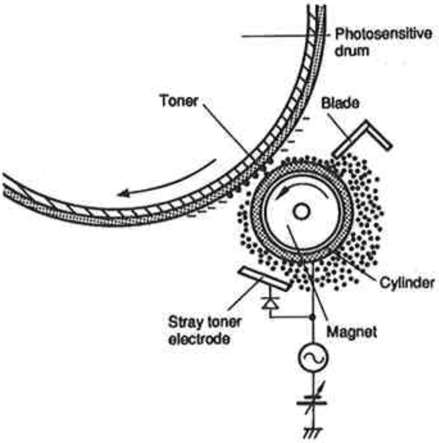


Figure 2-8

In this step, the latent static image on the drum surface is turned into a visible image.

In the case of the copier, the light areas of the drum, i.e., areas that have been exposed to the laser beam, will receive toner which is charged to a negative potential as in primary charging.

As shown in Figure 2-8, the developing assembly consists of a developing cylinder and a magnetic blade.

The developing cylinder, on the other hand, consists of a field magnet and a cylinder that revolves around it.

The developer is composed of toner (mainly of resins and dyes) and carrier (iron powder) mixed in a specific ratio. The toner and the carrier (iron powder) become charged through friction against each other so that the toner assumes a negative potential and the carrier, positive.

The developer is held inside the magnetic field of the fixed magnet as if to cling to the cylinder surface, and a blade is used to make sure that the toner is kept in a uniform layer.

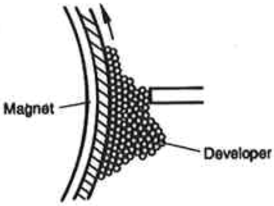
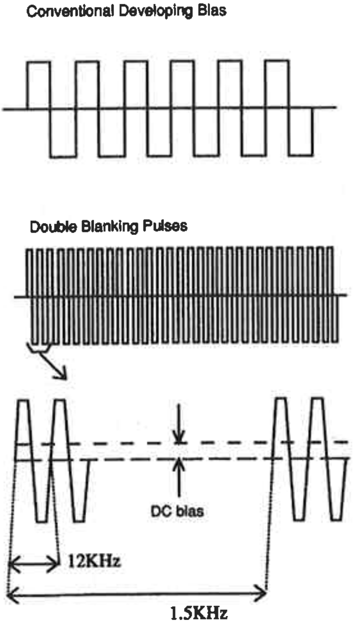


Figure 2-9

The developing cylinder is subjected to both double blanking pulses and DC bias (negative component) simultaneously for better developing efficiency and better reproduction of highlights; for this reason, the negative component of the developing bias is higher than the positive component.


Conventional Developing Bias

Double Blanking Pulses

Figure 2-10

During copying operation, the toner is attracted to the light areas on the photosensitive drum by the work of the drum surface potential and the negative component of the developing bias, turning the latent static image on the drum into a visible image—any excess toner is drawn off the photosensitive drum by the work of the drum surface potential and the positive component of the developing bias.

A high voltage (negative) is applied to the electrode under the cylinder of the developing assembly to prevent toner from moving astray.

G. Retention (step 5)

The copier's transfer drum does not have a gripper; instead, it uses a method in which paper is attracted from the registration roller to the transfer drum sheet by means of static electricity in a process called *retention.*

A retention brush and retention push-on roller are found where copy paper comes into contact with the transfer drum. The retention brush remains in contact with the inner side of the transfer drum sheet, and is supplied with negative charges which attract copy paper to the transfer drum sheet.

The smoothing brush and smoothing roller both serve to keep the charges on copy paper even.

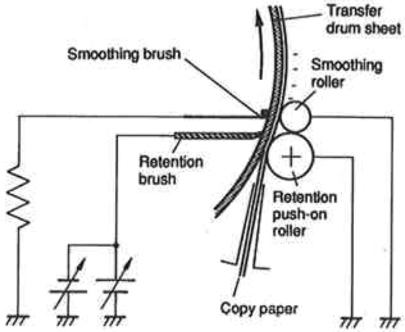


Figure 2-11

H. Transfer (step 6)

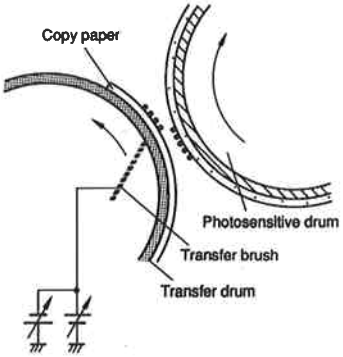

Copy paper
Photosensitive drum
Transfer brush
Transfer drum

Figure 2-12

The toner on the photosensitive drum surface is transfered to copy paper by applying negative/ positive charges to the back of copy paper (inner side of the transfer drum) where copy paper and photosensitive drum are in contact with each other.

I. Separation (step 7)

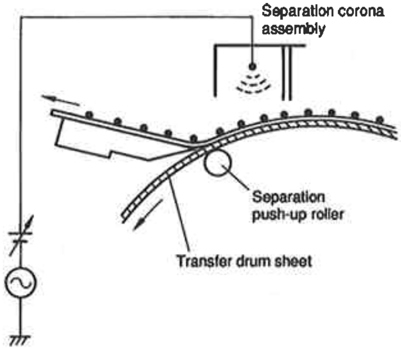

Separation corona assembly
Separation push-up roller
Transfer drum sheet

Figure 2-13

Copy paper is separated from the transfer drum using the separation claw and separation push-up roller. Since copy paper is held on the transfer drum by the work of static electricity, the separation corona assembly is used to apply an AC corona and DC bias to facilitate the separation of copy paper from the transfer drum.

J. Photosensitive Drum Cleaning (step 8)

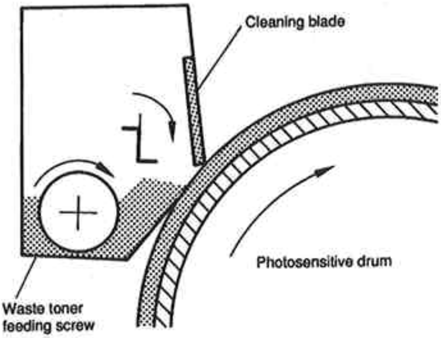

Cleaning blade
Photosensitive drum
Waste toner feeding screw

Figure 2-14

To prepare for the next copying cycle, the cleaning blade is used to scrape and collect the toner that remains on the drum surface.

The toner collected by the cleaning blade is moved toward the rear and through the back of the copier by the waste toner feeding screw for storage in the waste toner container.

K. Fixing (step 9)

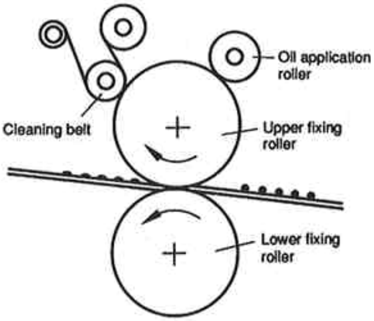

Oil application roller
Cleaning belt
Upper fixing roller
Lower fixing roller

Figure 2-15

Copy paper for which transfer has been executed as much as four times is forwarded to the fixing assembly, where it is heated by two fixing rollers. During the process, the color toners representing four colors are melted and mixed to reproduce the intended colors and, at the same time, fixed to copy paper.

To prevent adhesion of toner from copy paper to the fixing roller (called offset), the roller surface is given amounts of silicone oil as necessary. Further, the fixing roller is kept clean by a cleaning belt and blade.

II. AUXILIARY PROCESS

A. Static Eliminator

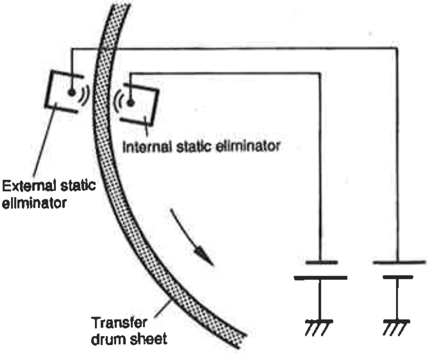

Internal static eliminator
External static eliminator
Transfer drum sheet

Figure 2-16

The charges applied to the transfer drum sheet after separation of copy paper are in any of four stages from negative to positive depending on the selected copy mode (1-color to 4-color), necessitating appropriate removal of these charges in preparation for the next retention of copy paper—in practice, negative charging is executed.

B. Transfer Drum Cleaning

The copier is equipped with transfer cleaners 1, 2, and 3 to keep the transfer drum sheet clean.

The transfer cleaner is operated during post-copying rotation, the transfer cleaner 2 is operated during post rotation that follows the making of a two-sided copy, and the transfer cleaner 3 is operated during post rotation that follows the making of a specific number of copies.

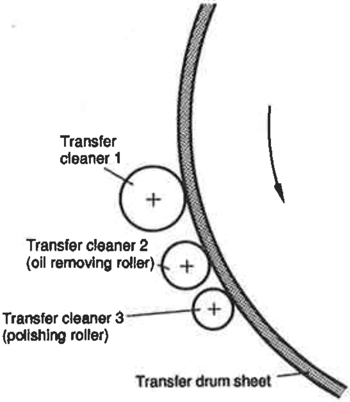

Transfer cleaner 1
Transfer cleaner 2
(oil removing roller)
Transfer cleaner 3
(polishing roller)
Transfer drum sheet

Figure 2-17

C. Ozone Filter

The exhaust fan assembly is equipped with three catalytic filters to decompose the ozone generated by each corona assembly.

III. LIMITATIONS

A. Outline

There are many difficulties in making high quality color prints by an electrophotographic process, some of which are discussed below. The Color Laser Copier has many design features to minimize these difficulties, and they are very successful.

However, the prints are not of the same quality as those in high-quality printed material, such as magazine illustrations and photographs.

Each product has its own advantages and limitations, and users of the copying machine should be made aware of the capabilities of the machine.

B. Characteristics

1. OPC

The sensitivity of the OPC used for the photosensitive drum is subject to the environment in which the machine is used and changes over time.

2. Reflectance of Toner

The ideal toners, representing the primary colors (yellow, magenta, and cyan), should absorb 100 percent of the spectrum of their complementary colors and reflect 100 percent of the rest. Such toners, however, are not available at present.

3. Dry Electrostatic Photography and Gradation

As shown in Figure 2-18, it is impossible to reproduce the density of the original document exactly the same because of the characteristics of photosensitive material and toner.

The powder toner, further, limits the details of the image to the diameter of its individual particles.

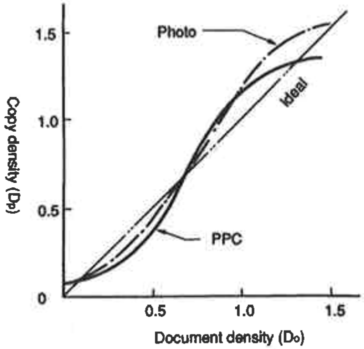


Figure 2-18

These limitations, however, have been solved to a point where they will not present visible problems by controlling the image processing and image processing by the scanner unit.

CHAPTER 3

OPERATIONS AND TIMING

This chapter explains what each function does and its relationship to the electrical and mechanical systems. The timing of operation of each part is described by function; in the diagrams ▬▬▬, represents the route of mechanical drive, and #### represents electrical signals when accompanied by signal names. The basic time values that pertain to timing are as follows:

single rotation of transfer drum	4.25 sec
single rotation of photosensitive drum	4.25 sec

In the digital circuit diagrams, '1' indicates that the voltage level of the signal is High and '0', Low; the voltage, however, depends on the circuit. Further, note that the notation 'DRMD*' indicates that the DRMD signal goes on when '0'.

Although the copier uses microprocessors, this chapter does not discuss their operations since checks on their internal mechanisms are not practical. Further, since the PCBs are not to be repaired at the user's, the circuits are described only briefly using block diagrams — explanations of the circuits, therefore, will be limited to lines between inputs and outputs of the sensors and lines from outputs to loads with block diagrams by function.

Some steps used to disassemble/assemble the machine differ depending on the type of machine; such steps are identified by notation TYPE1/TYPE2 in this manual:

Model	CLC700		CLC800	
TYPE	TYPE1	TYPE2	TYPE1	TYPE2
115V(TWN)	NCN xxxx	NKN xxxx	NCT xxxx	NKT xxxx
115V(USA)	NCL xxxx	NKL xxxx	NCS xxxx	NKS xxxx
230V(KOR)	———	PKR xxxx	———	———
230V(Others)	PCN xxxx	PKN xxxx	PCS xxxx	PKS xxxx
230V(UK)	QCQ xxxx	QKQ xxxx	QCS xxxx	QKS xxxx
230V(CA)	RCQ xxxx	RKQ xxxx	RCS xxxx	RKS xxxx
230V(FRN)	SCR xxxx	SKR xxxx	SCS xxxx	SKS xxxx
230V(GER)	TCR xxxx	TKR xxxx	TCS xxxx	TKS xxxx
230V(AMS)	UCR xxxx	UKR xxxx	UCS xxxx	UKS xxxx

I. BASIC OPERATION 3-1
II. ORIGINAL EXPOSURE SYSTEM 3-33
III. IMAGE PROCESSING SYSTEM 3-41
IV. LASER EXPOSURE SYSTEM 3-65
V. IMAGE FORMATION SYSTEM 3-69
VI. PICK-UP/FEEDING SYSTEM 3-115
VII. CONTROL PANEL 3-176
VIII. EDITOR 3-178
IX. FANS 3-182
X. POWER SUPPLY 3-185
XI. SERVICE MODE 3-188
XII. SELF DIAGNOSIS 3-292

CANON COLOR LASER COPIER 700/800 REV.2 NOV. 1996 PRINTED IN JAPAN (IMPRIME AU JAPON)

I. BASIC OPERATION

A. Functional Construction

The copier's functions may be classified into six blocks: namely, pick-up/feeding system, original exposure system, laser exposure system, image formation system, and control system.

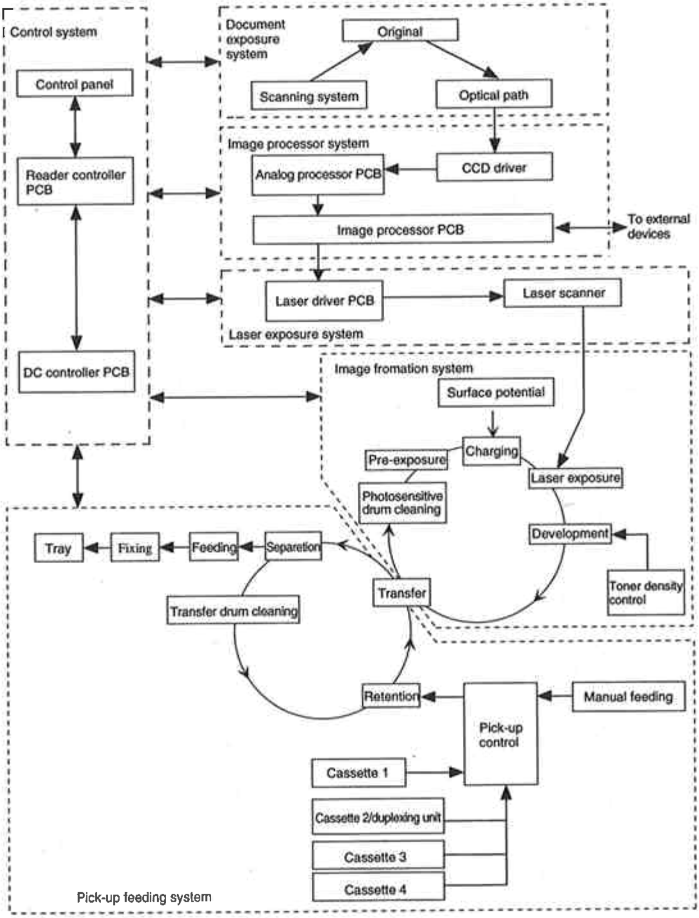

Control system
Control panel
Reader controller PCB
DC controller PCB
Document exposure system
Original
Scanning system
Optical path
Image processor system
Analog processor PCB
CCD driver
Image processor PCB
To external devices
Laser driver PCB
Laser scanner
Laser exposure system
Image fromation system
Surface potential
Charging
Pre-exposure
Laser exposure
Photosensitive drum cleaning
Development
Toner density control
Transfer
Tray
Fixing
Feeding
Separation
Transfer drum cleaning
Retention
Pick-up control
Manual feeding
Cassette 1
Cassette 2/duplexing unit
Cassette 3
Cassette 4
Pick-up feeding system

Figure 3-101

B. Electrical Circuitry

The copier's major electrical mechanisms are controlled by a microprocessor found on the reader controller PCB and DC controller PCB. The reader controller PCB and DC controller PCB each are equipped with a lithium battery for backing up the data needed by the PCBs.

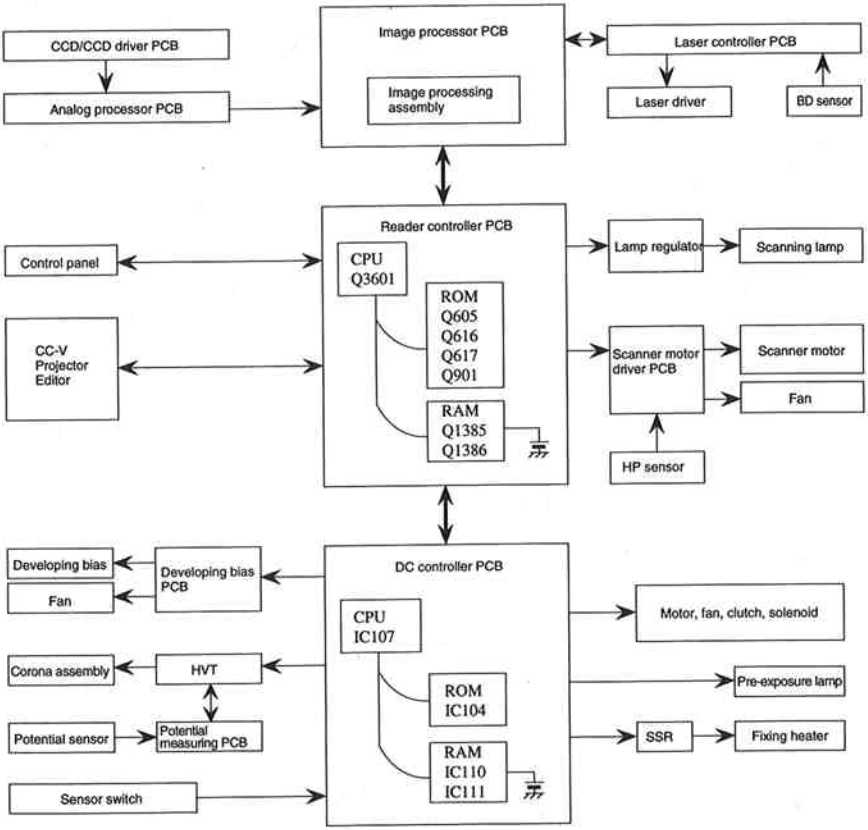

CCD/CCD driver PCB
Analog processor PCB
Image processor PCB
Image processing assembly
Laser controller PCB
Laser driver
BD sensor
Reader controller PCB
CPU Q3601
ROM Q605 Q616 Q617 Q901
RAM Q1385 Q1386
Control panel
CC-V Projector Editor
Lamp regulator
Scanning lamp
Scanner motor driver PCB
Scanner motor
Fan
HP sensor
DC controller PCB
CPU IC107
ROM IC104
RAM IC110 IC111
Developing bias
Fan
Developing bias PCB
Corona assembly
HVT
Potential sensor
Potential measuring PCB
Sensor switch
Motor, fan, clutch, solenoid
Pre-exposure lamp
SSR
Fixing heater

Figure 3-102

C. Inputs to and Outputs from Major PCBs

Inputs to and Outputs from the Reader Controller (1/3)

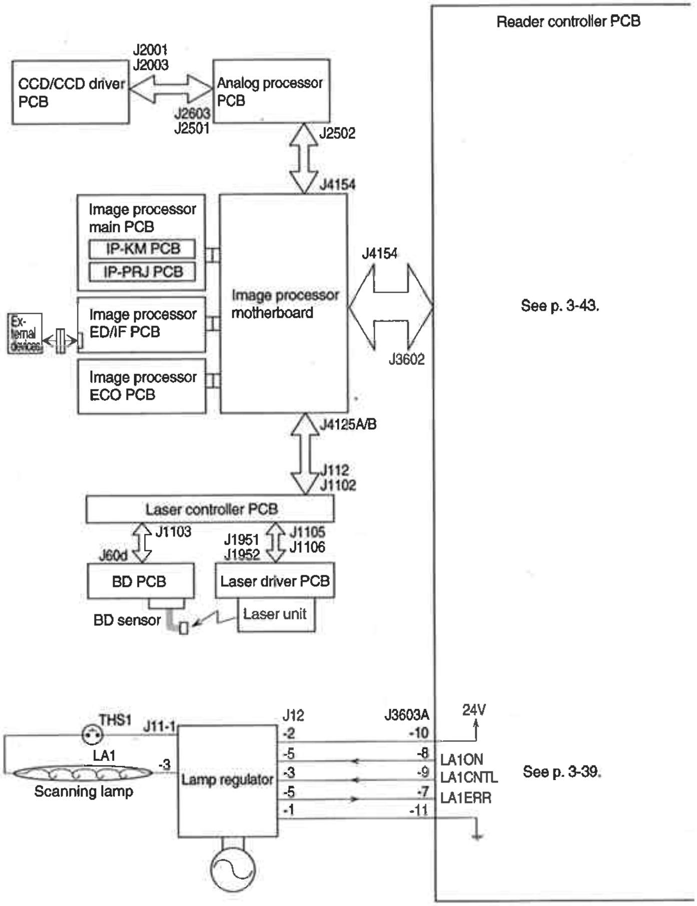

Reader controller PCB
J2001
J2003
CCD/CCD driver PCB
Analog processor PCB
J2603
J2501
J2502
J4154
Image processor main PCB
IP-KM PCB
IP-PRJ PCB
Ex-ternal devices
Image processor ED/IF PCB
Image processor ECO PCB
Image processor motherboard
J4154
J3602
See p. 3-43.
J4125A/B
J112
J1102
Laser controller PCB
J1103
J60d
J1951
J1952
J1105
J1106
BD PCB
Laser driver PCB
BD sensor
Laser unit
THS1
J11-1
LA1
-3
Scanning lamp
Lamp regulator
J12
-2
-5
-3
-5
-1
J3603A
-10
-8
-9
-7
-11
24V
LA1ON
LA1CNTL
LA1ERR
See p. 3-39.

Figure 3-103

Inputs to and Outputs from the Reader Controller (2/3. TYPE1)

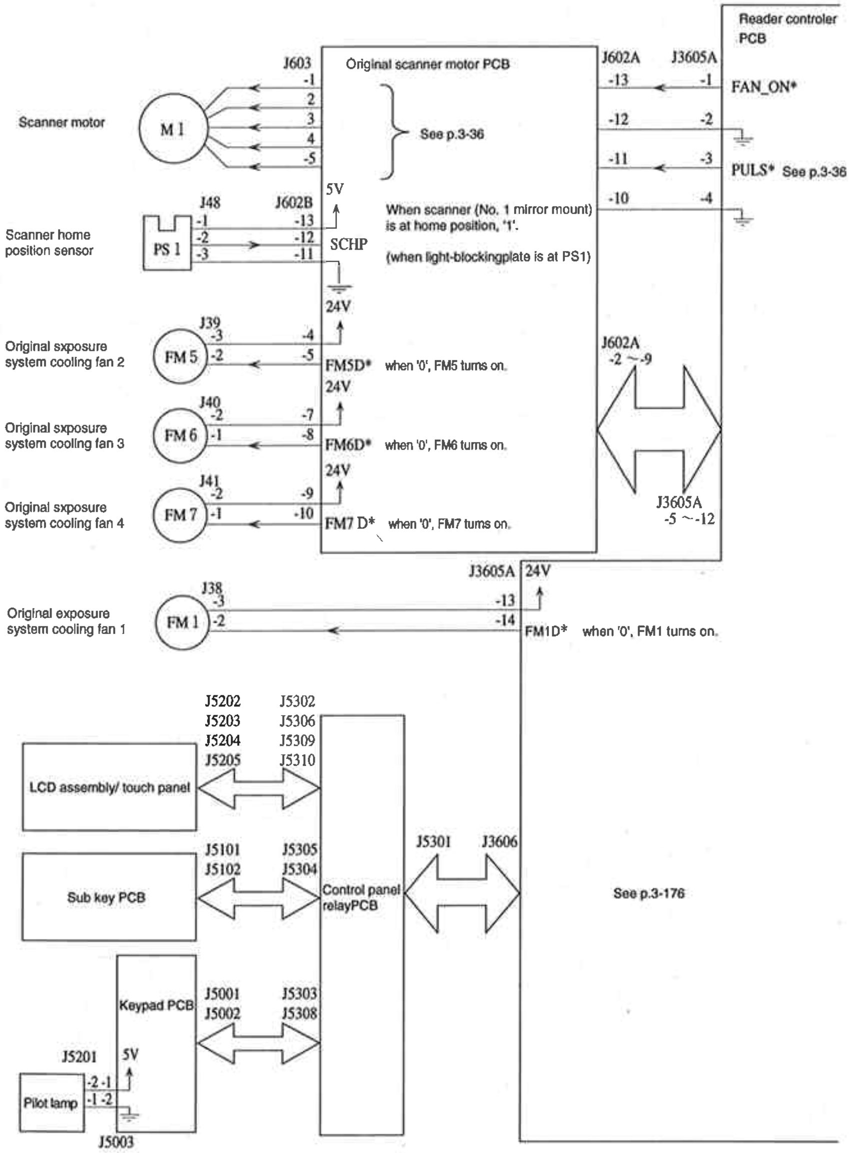

Reader controler PCB
J603
Original scanner motor PCB
J602A
J3605A
-1
2
3
4
-5
-13
-1
FAN_ON*
Scanner motor
M 1
See p.3-36
-12
-2
-11
-3
PULS* See p.3-36
5V
J48
J602B
-10
-4
-1
-13
When scanner (No. 1 mirror mount) is at home position, '1'.
-2
-12
Scanner home position sensor
PS 1
SCHP
-3
-11
(when light-blockingplate is at PS1)
24V
J39
-3
-4
J602A
-2 ~-9
Original sxposure system cooling fan 2
FM 5
-2
-5
FM5D*
when '0', FM5 turns on.
24V
J40
-2
-7
Original sxposure system cooling fan 3
FM 6
-1
-8
FM6D*
when '0', FM6 turns on.
24V
J41
-2
-9
J3605A
-5 ~-12
Original sxposure system cooling fan 4
FM 7
-1
-10
FM7 D*
when '0', FM7 turns on.
J3605A
24V
J38
-3
-13
Original exposure system cooling fan 1
FM 1
-2
-14
FM1D*
when '0', FM1 turns on.
J5202
J5302
J5203
J5306
J5204
J5309
J5205
J5310
LCD assembly/ touch panel
J5101
J5305
J5301
J3606
J5102
J5304
Sub key PCB
Control panel relayPCB
See p.3-176
Keypad PCB
J5001
J5303
J5002
J5308
J5201
5V
-2 -1
Pilot lamp
-1 -2
J5003

Figure 3-104A

Inputs to and Outputs from the Reader Controller (2/3. TYPE2)

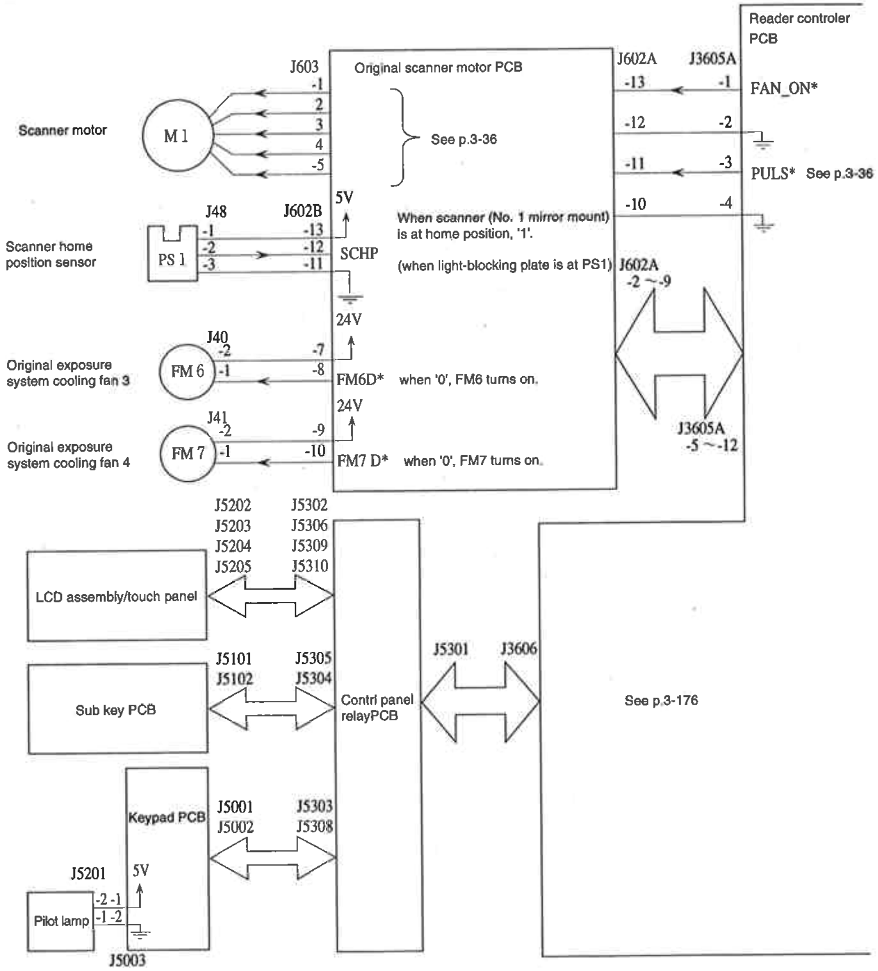

Reader controler PCB
J603
Original scanner motor PCB
J602A
J3605A
-1
2
3
4
-5
-13
-12
-11
-10
-1
-2
-3
-4
FAN_ON*
PULS* See p.3-36
Scanner motor
M1
See p.3-36
5V
J48
J602B
-1
-2
-3
-13
-12
-11
SCHP
When scanner (No. 1 mirror mount) is at home position, '1'.
(when light-blocking plate is at PS1)
Scanner home position sensor
PS 1
J602A -2 ~-9
24V
J40
-2
-1
-7
-8
Original exposure system cooling fan 3
FM 6
FM6D* when '0', FM6 turns on.
24V
J41
-2
-1
-9
-10
Original exposure system cooling fan 4
FM 7
FM7 D* when '0', FM7 turns on.
J3605A -5 ~-12
J5202 J5203 J5204 J5205
J5302 J5306 J5309 J5310
LCD assembly/touch panel
J5101 J5102
J5305 J5304
Sub key PCB
Contrl panel relayPCB
J5301
J3606
See p.3-176
Keypad PCB
J5001 J5002
J5303 J5308
J5201
5V
-2 -1
-1 -2
Pilot lamp
J5003

Figure 3-104B

Inputs to and Outputs from the Reader Controller (3/3)

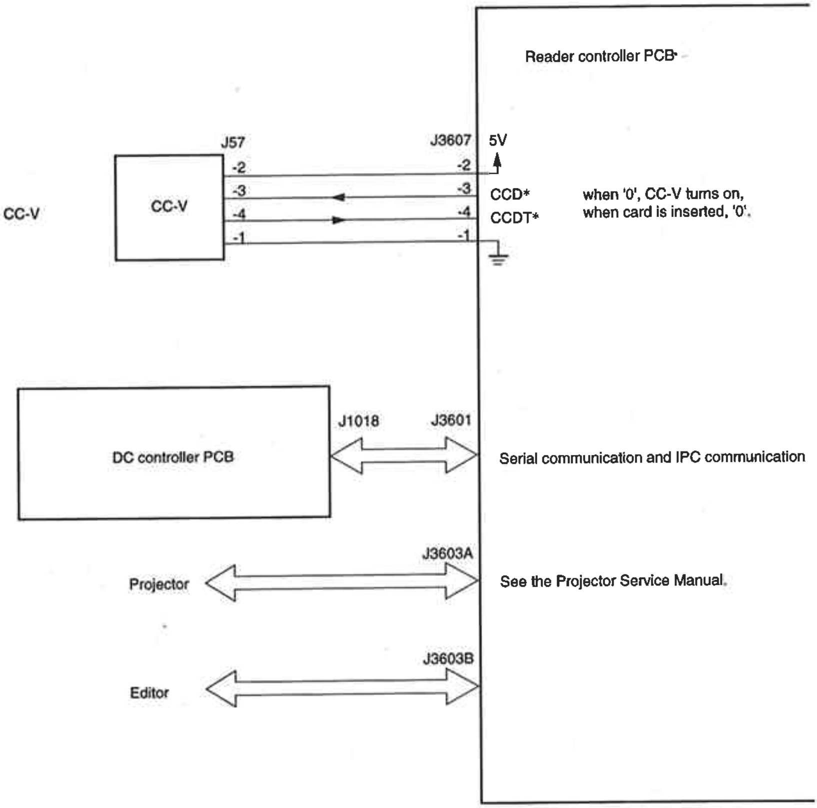

Reader controller PCB
CC-V
J57
CC-V
-2
-3
-4
-1
J3607
-2
-3
-4
-1
5V
CCD*
CCDT*
when '0', CC-V turns on,
when card is inserted, '0'.
DC controller PCB
J1018
J3601
Serial communication and IPC communication
Projector
J3603A
See the Projector Service Manual.
Editor
J3603B

Figure 3-105

Inputs to the DC Controller (1/7)

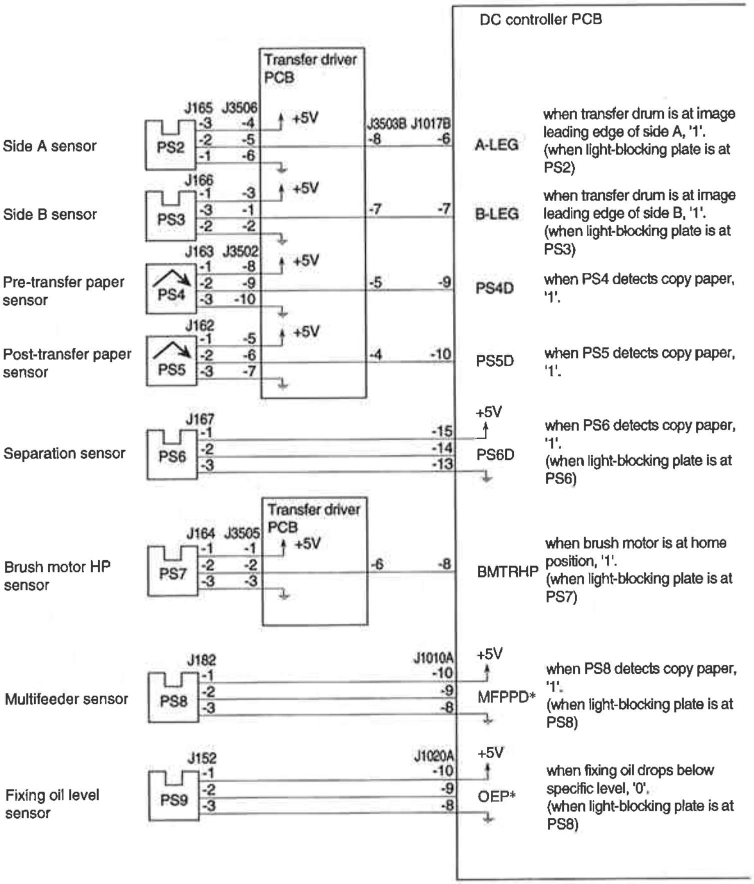

DC controller PCB
Transfer driver PCB
Side A sensor
PS2
J165 J3506
-3 -4
-2 -5
-1 -6
+5V
J3503B J1017B
-8 -6
A-LEG
when transfer drum is at image leading edge of side A, '1'. (when light-blocking plate is at PS2)
Side B sensor
PS3
J166
-1 -3
-3 -1
-2 -2
+5V
-7 -7
B-LEG
when transfer drum is at image leading edge of side B, '1'. (when light-blocking plate is at PS3)
Pre-transfer paper sensor
PS4
J163 J3502
-1 -8
-2 -9
-3 -10
+5V
-5 -9
PS4D
when PS4 detects copy paper, '1'.
Post-transfer paper sensor
PS5
J162
-1 -5
-2 -6
-3 -7
+5V
-4 -10
PS5D
when PS5 detects copy paper, '1'.
Separation sensor
PS6
J167
-1 -15
-2 -14
-3 -13
+5V
PS6D
when PS6 detects copy paper, '1'. (when light-blocking plate is at PS6)
Transfer driver PCB
Brush motor HP sensor
PS7
J164 J3505
-1 -1
-2 -2
-3 -3
+5V
-6 -8
BMTRHP
when brush motor is at home position, '1'. (when light-blocking plate is at PS7)
Multifeeder sensor
PS8
J182
J1010A
-1 -10
-2 -9
-3 -8
+5V
MFPPD*
when PS8 detects copy paper, '1'. (when light-blocking plate is at PS8)
Fixing oil level sensor
PS9
J152
J1020A
-1 -10
-2 -9
-3 -8
+5V
OEP*
when fixing oil drops below specific level, '0'. (when light-blocking plate is at PS8)

Figure 3-106

Inputs to the DC Controller PCB (2/7)

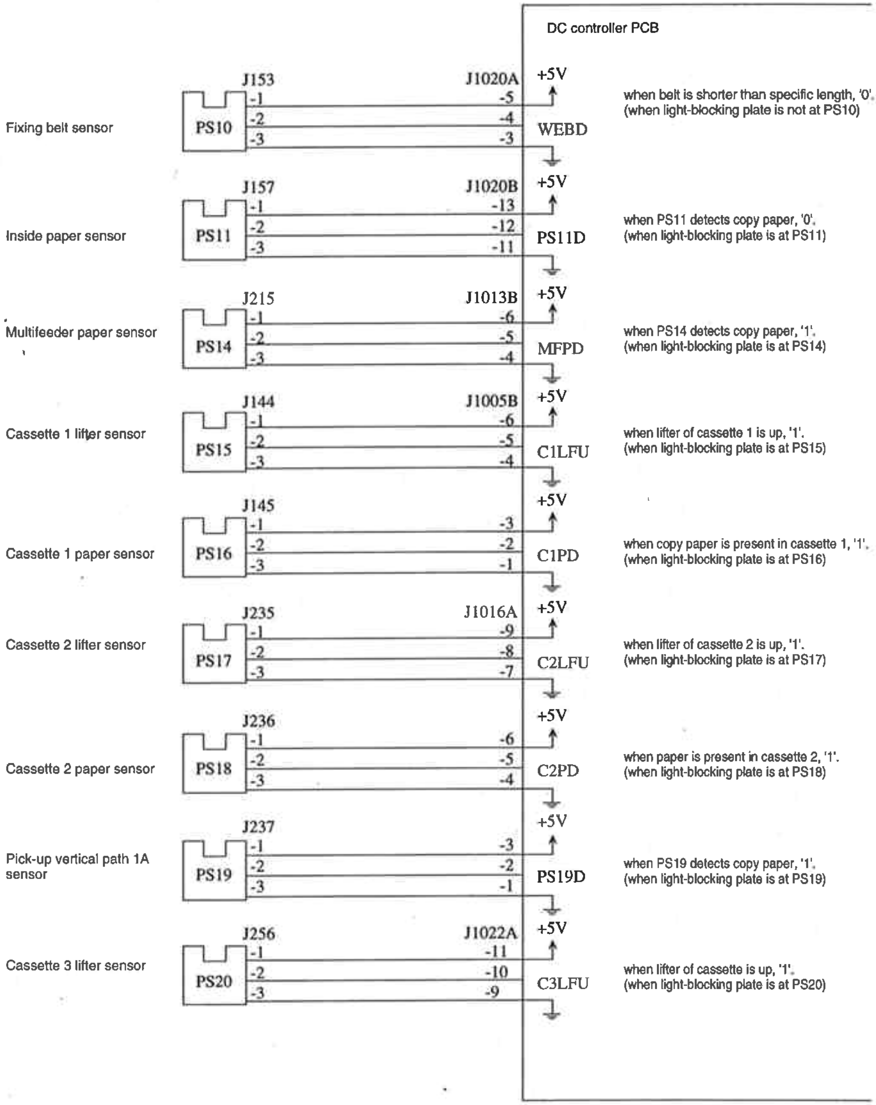
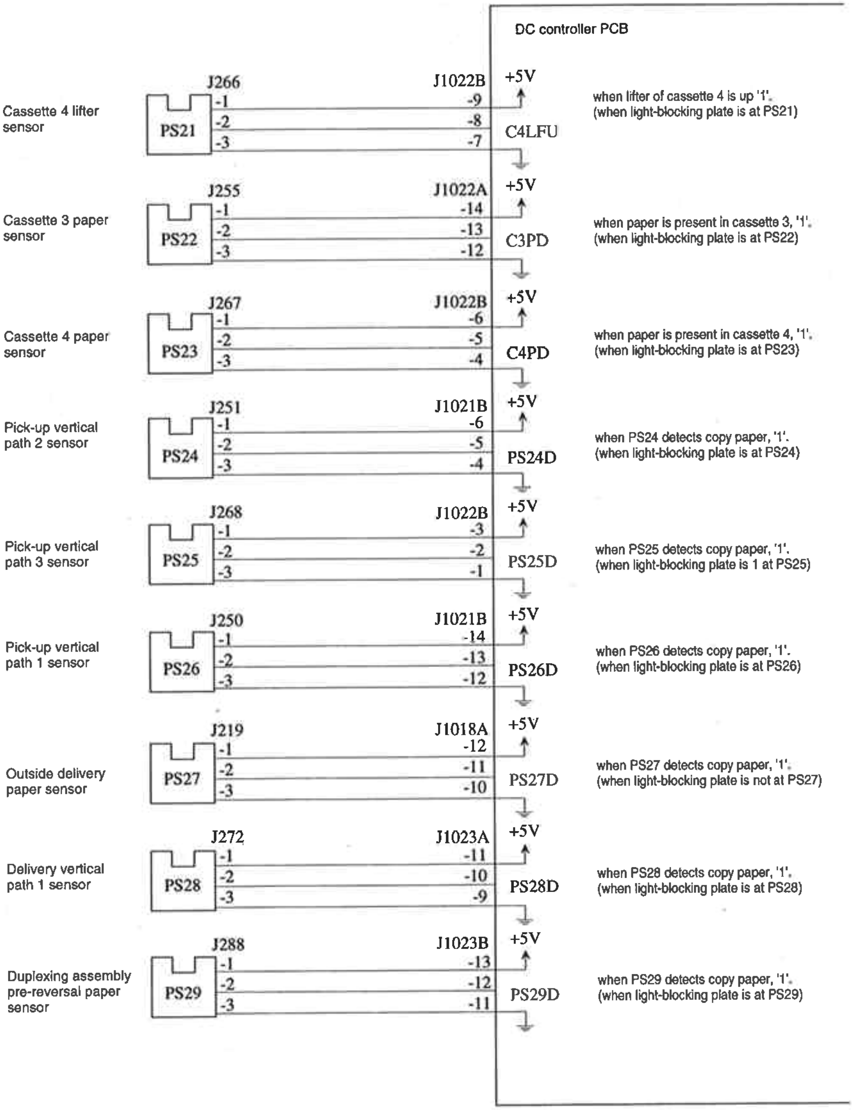

DC controller PCB
Fixing belt sensor
PS10
J153
-1
-2
-3
J1020A
-5
-4
-3
+5V
WEBD
when belt is shorter than specific length, '0'.
(when light-blocking plate is not at PS10)
Inside paper sensor
PS11
J157
-1
-2
-3
J1020B
-13
-12
-11
+5V
PS11D
when PS11 detects copy paper, '0'.
(when light-blocking plate is at PS11)
Multifeeder paper sensor
PS14
J215
-1
-2
-3
J1013B
-6
-5
-4
+5V
MFPD
when PS14 detects copy paper, '1'.
(when light-blocking plate is at PS14)
Cassette 1 lifter sensor
PS15
J144
-1
-2
-3
J1005B
-6
-5
-4
+5V
C1LFU
when lifter of cassette 1 is up, '1'.
(when light-blocking plate is at PS15)
Cassette 1 paper sensor
PS16
J145
-1
-2
-3
-3
-2
-1
+5V
C1PD
when copy paper is present in cassette 1, '1'.
(when light-blocking plate is at PS16)
Cassette 2 lifter sensor
PS17
J235
-1
-2
-3
J1016A
-9
-8
-7
+5V
C2LFU
when lifter of cassette 2 is up, '1'.
(when light-blocking plate is at PS17)
Cassette 2 paper sensor
PS18
J236
-1
-2
-3
-6
-5
-4
+5V
C2PD
when paper is present in cassette 2, '1'.
(when light-blocking plate is at PS18)
Pick-up vertical path 1A sensor
PS19
J237
-1
-2
-3
-3
-2
-1
+5V
PS19D
when PS19 detects copy paper, '1'.
(when light-blocking plate is at PS19)
Cassette 3 lifter sensor
PS20
J256
-1
-2
-3
J1022A
-11
-10
-9
+5V
C3LFU
when lifter of cassette is up, '1'.
(when light-blocking plate is at PS20)

Figure 3-107

Inputs to the DC controller PCB (3/7)


DC controller PCB
Cassette 4 lifter sensor
PS21
J266 -1 -2 -3
J1022B -9 -8 -7
+5V
C4LFU
Cassette 3 paper sensor
PS22
J255 -1 -2 -3
J1022A -14 -13 -12
+5V
C3PD
Cassette 4 paper sensor
PS23
J267 -1 -2 -3
J1022B -6 -5 -4
+5V
C4PD
Pick-up vertical path 2 sensor
PS24
J251 -1 -2 -3
J1021B -6 -5 -4
+5V
PS24D
Pick-up vertical path 3 sensor
PS25
J268 -1 -2 -3
J1022B -3 -2 -1
+5V
PS25D
Pick-up vertical path 1 sensor
PS26
J250 -1 -2 -3
J1021B -14 -13 -12
+5V
PS26D
Outside delivery paper sensor
PS27
J219 -1 -2 -3
J1018A -12 -11 -10
+5V
PS27D
Delivery vertical path 1 sensor
PS28
J272 -1 -2 -3
J1023A -11 -10 -9
+5V
PS28D
Duplexing assembly pre-reversal paper sensor
PS29
J288 -1 -2 -3
J1023B -13 -12 -11
+5V
PS29D

when lifter of cassette 4 is up '1'.
(when light-blocking plate is at PS21)

when paper is present in cassette 3, '1'.
(when light-blocking plate is at PS22)

when paper is present in cassette 4, '1'.
(when light-blocking plate is at PS23)

when PS24 detects copy paper, '1'.
(when light-blocking plate is at PS24)

when PS25 detects copy paper, '1'.
(when light-blocking plate is 1 at PS25)

when PS26 detects copy paper, '1'.
(when light-blocking plate is at PS26)

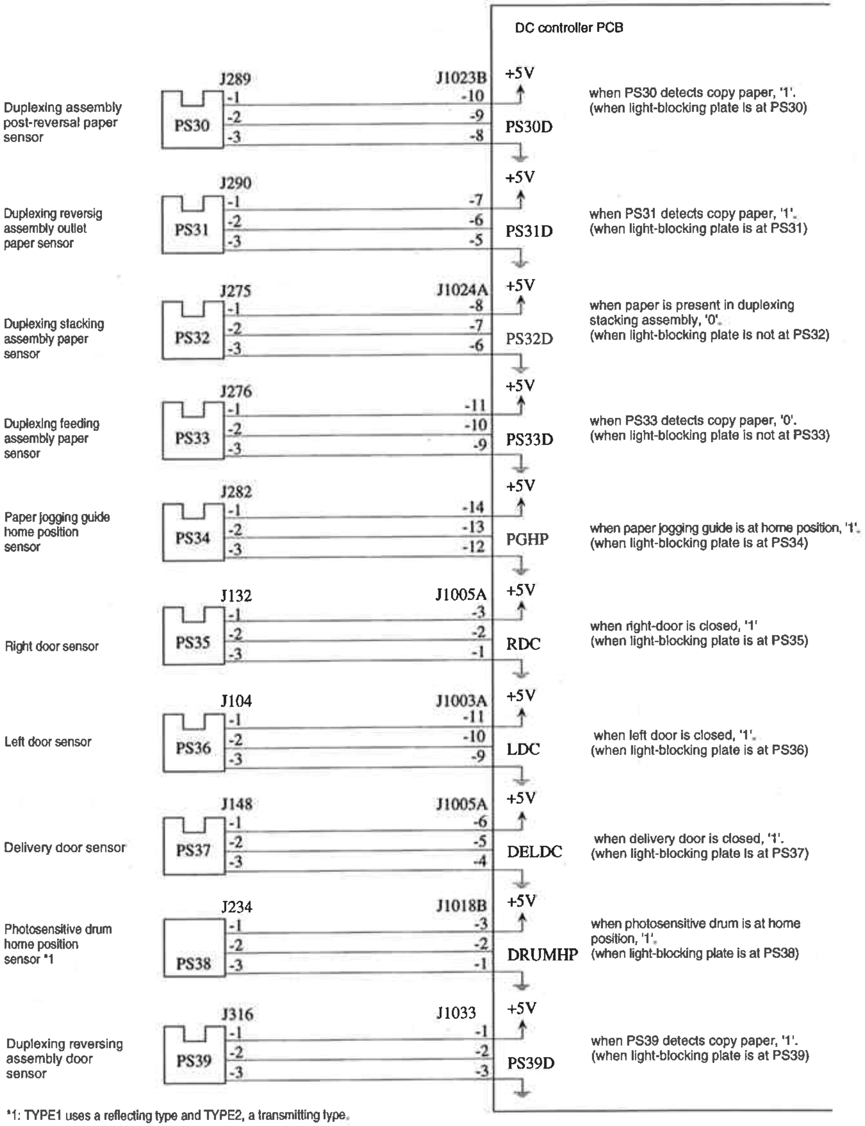
when PS27 detects copy paper, '1'.
(when light-blocking plate is not at PS27)

when PS28 detects copy paper, '1'.
(when light-blocking plate is at PS28)

when PS29 detects copy paper, '1'.
(when light-blocking plate is at PS29)

Figure 3-108

Inputs to the DC Controller PCB (4/7)


DC controller PCB
Duplexing assembly post-reversal paper sensor
PS30
J289
-1
-2
-3
J1023B
-10
-9
-8
+5V
PS30D
Duplexing reversig assembly outlet paper sensor
PS31
J290
-1
-2
-3
-7
-6
-5
+5V
PS31D
Duplexing stacking assembly paper sensor
PS32
J275
-1
-2
-3
J1024A
-8
-7
-6
+5V
PS32D
Duplexing feeding assembly paper sensor
PS33
J276
-1
-2
-3
-11
-10
-9
+5V
PS33D
Paper jogging guide home position sensor
PS34
J282
-1
-2
-3
-14
-13
-12
+5V
PGHP
Right door sensor
PS35
J132
-1
-2
-3
J1005A
-3
-2
-1
+5V
RDC
Left door sensor
PS36
J104
-1
-2
-3
J1003A
-11
-10
-9
+5V
LDC
Delivery door sensor
PS37
J148
-1
-2
-3
J1005A
-6
-5
-4
+5V
DELDC
Photosensitive drum home position sensor *1
PS38
J234
-1
-2
-3
J1018B
-3
-2
-1
+5V
DRUMHP
Duplexing reversing assembly door sensor
PS39
J316
-1
-2
-3
J1033
-1
-2
-3
+5V
PS39D

when PS30 detects copy paper, '1'.
(when light-blocking plate is at PS30)

when PS31 detects copy paper, '1'.
(when light-blocking plate is at PS31)

when paper is present in duplexing stacking assembly, '0'.
(when light-blocking plate is not at PS32)

when PS33 detects copy paper, '0'.
(when light-blocking plate is not at PS33)

when paper jogging guide is at home position, '1'.
(when light-blocking plate is at PS34)

when right-door is closed, '1'
(when light-blocking plate is at PS35)

when left door is closed, '1'.
(when light-blocking plate is at PS36)

when delivery door is closed, '1'.
(when light-blocking plate is at PS37)

when photosensitive drum is at home position, '1'.
(when light-blocking plate is at PS38)

when PS39 detects copy paper, '1'.
(when light-blocking plate is at PS39)

*1: TYPE1 uses a reflecting type and TYPE2, a transmitting type.

Figure 3-109

Inputs to the DC Controller PCB (5/7)

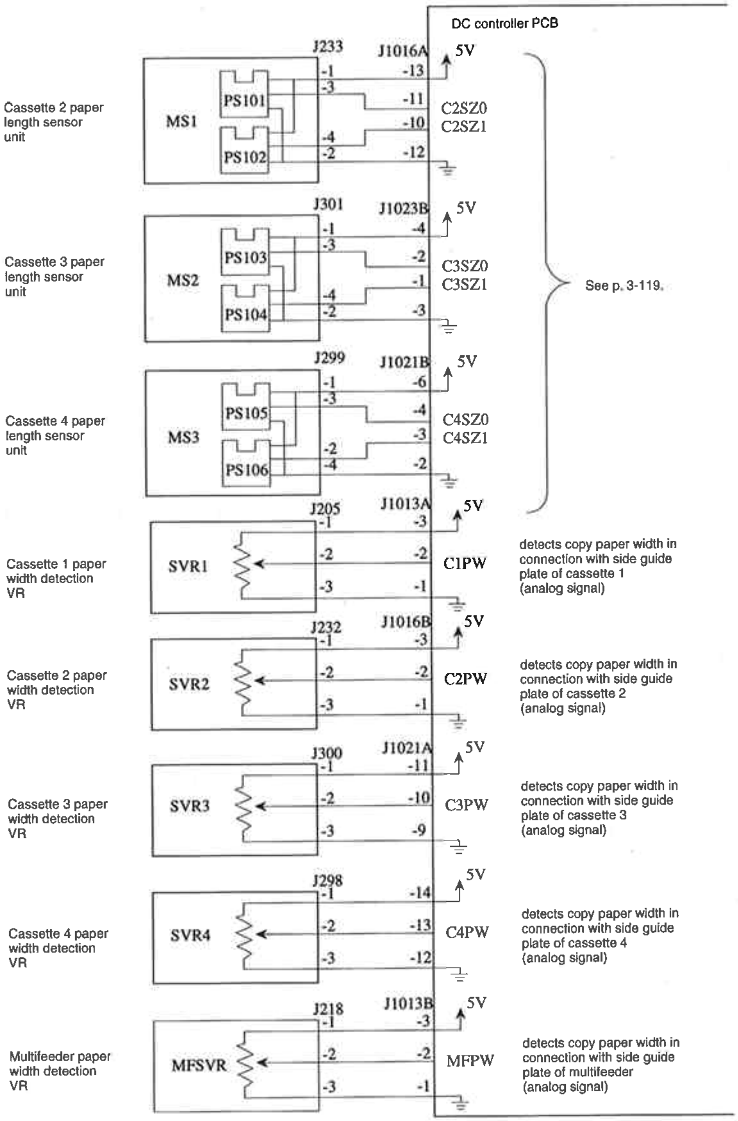

DC controller PCB
Cassette 2 paper length sensor unit
MS1
PS101
PS102
J233
-1
-3
-4
-2
J1016A
-13
-11
-10
-12
5V
C2SZ0
C2SZ1
Cassette 3 paper length sensor unit
MS2
PS103
PS104
J301
-1
-3
-4
-2
J1023B
-4
-2
-1
-3
5V
C3SZ0
C3SZ1
See p. 3-119.
Cassette 4 paper length sensor unit
MS3
PS105
PS106
J299
-1
-3
-2
-4
J1021B
-6
-4
-3
-2
5V
C4SZ0
C4SZ1
Cassette 1 paper width detection VR
SVR1
J205
-1
-2
-3
J1013A
-3
-2
-1
5V
C1PW
detects copy paper width in connection with side guide plate of cassette 1 (analog signal)
Cassette 2 paper width detection VR
SVR2
J232
-1
-2
-3
J1016B
-3
-2
-1
5V
C2PW
detects copy paper width in connection with side guide plate of cassette 2 (analog signal)
Cassette 3 paper width detection VR
SVR3
J300
-1
-2
-3
J1021A
-11
-10
-9
5V
C3PW
detects copy paper width in connection with side guide plate of cassette 3 (analog signal)
Cassette 4 paper width detection VR
SVR4
J298
-1
-2
-3
-14
-13
-12
5V
C4PW
detects copy paper width in connection with side guide plate of cassette 4 (analog signal)
Multifeeder paper width detection VR
MFSVR
J218
-1
-2
-3
J1013B
-3
-2
-1
5V
MFPW
detects copy paper width in connection with side guide plate of multifeeder (analog signal)

Figure 3-110

Inputs to the DC Controller PCB (6/7)

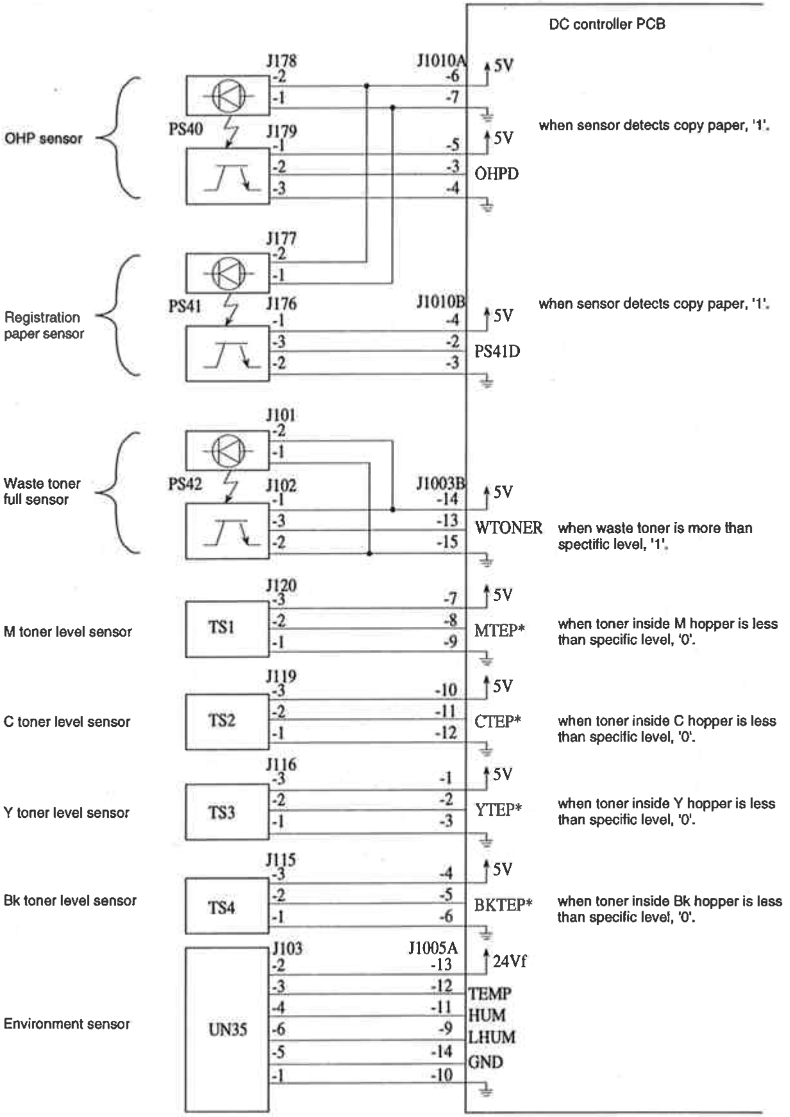

DC controller PCB
OHP sensor
J178
-2
-1
J1010A
-6
-7
5V
PS40
J179
-1
-2
-3
-5
-3
-4
5V
OHPD
when sensor detects copy paper, '1'.
Registration paper sensor
J177
-2
-1
PS41
J176
-1
-3
-2
J1010B
-4
-2
-3
5V
PS41D
when sensor detects copy paper, '1'.
Waste toner full sensor
J101
-2
-1
PS42
J102
-1
-3
-2
J1003B
-14
-13
-15
5V
WTONER
when waste toner is more than spectific level, '1'.
M toner level sensor
TS1
J120
-3
-2
-1
-7
-8
-9
5V
MTEP*
when toner inside M hopper is less than specific level, '0'.
C toner level sensor
TS2
J119
-3
-2
-1
-10
-11
-12
5V
CTEP*
when toner inside C hopper is less than specific level, '0'.
Y toner level sensor
TS3
J116
-3
-2
-1
-1
-2
-3
5V
YTEP*
when toner inside Y hopper is less than specific level, '0'.
Bk toner level sensor
TS4
J115
-3
-2
-1
-4
-5
-6
5V
BKTEP*
when toner inside Bk hopper is less than specific level, '0'.
Environment sensor
UN35
J103
-2
-3
-4
-6
-5
-1
J1005A
-13
-12
-11
-9
-14
-10
24Vf
TEMP
HUM
LHUM
GND

Figure 3-111

Inputs to the DC Controller PCB (7/7)

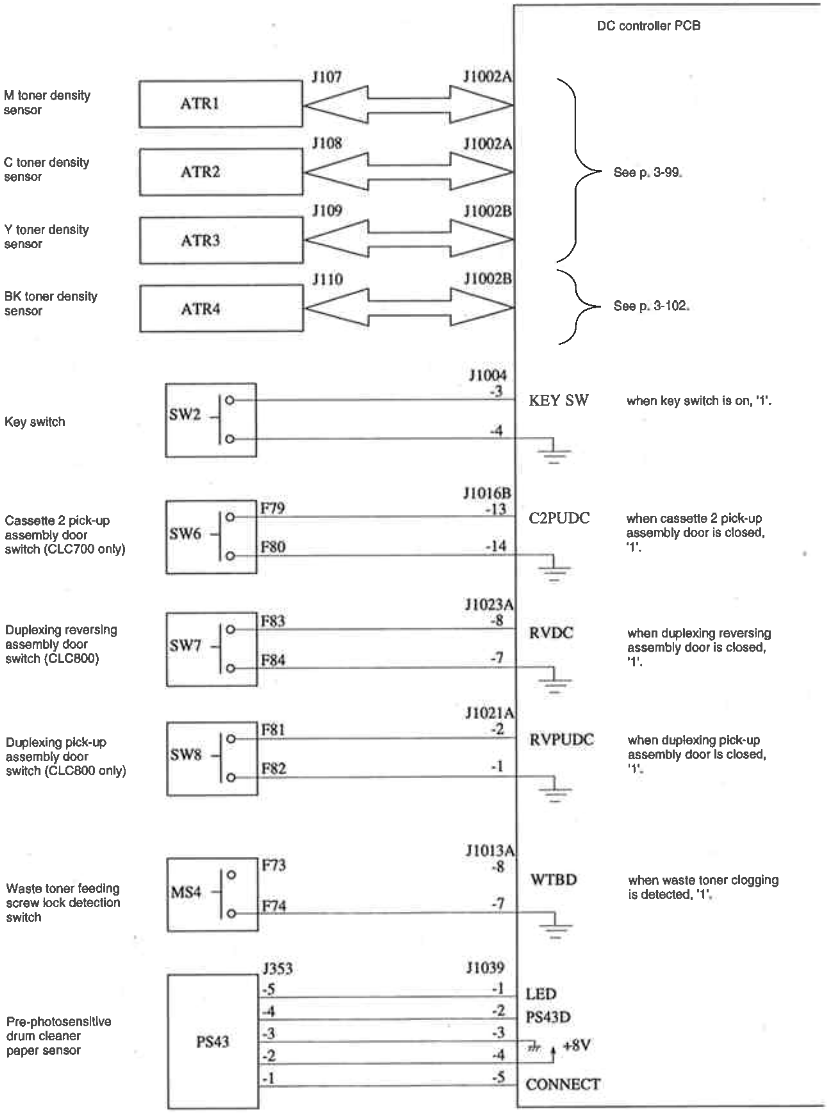
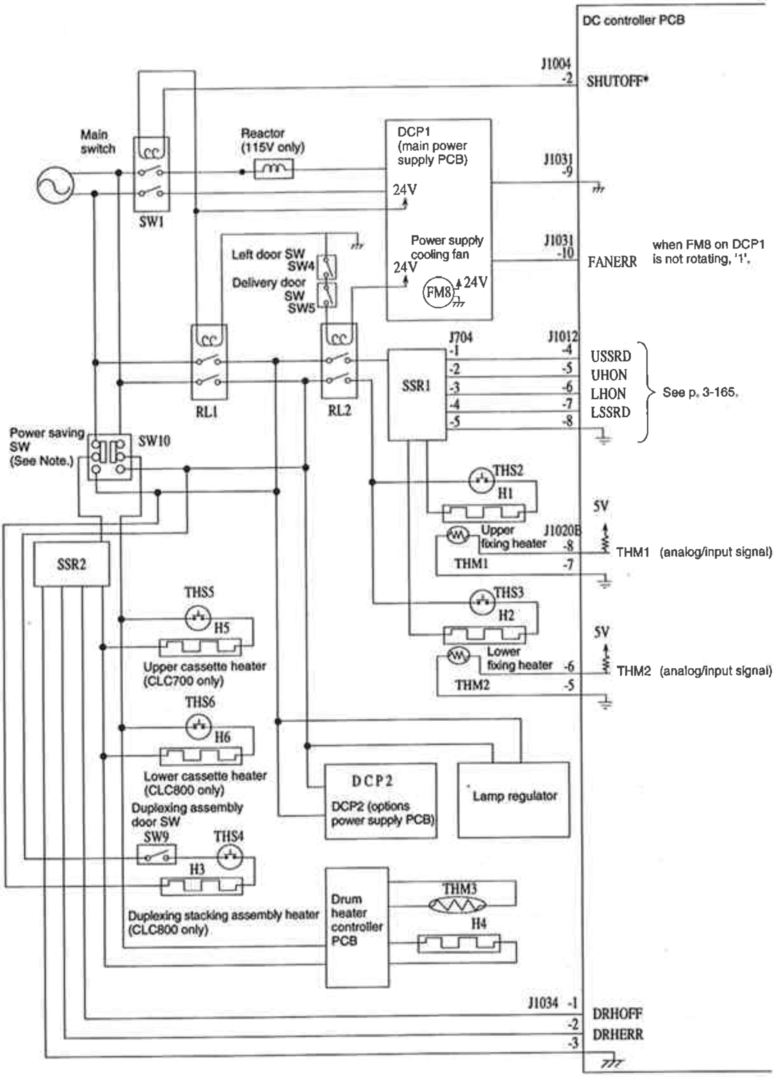

DC controller PCB
M toner density sensor
ATR1
J107
J1002A
C toner density sensor
ATR2
J108
J1002A
Y toner density sensor
ATR3
J109
J1002B
BK toner density sensor
ATR4
J110
J1002B
See p. 3-99.
See p. 3-102.
Key switch
SW2
J1004
-3
-4
KEY SW
when key switch is on, '1'.
Cassette 2 pick-up assembly door switch (CLC700 only)
SW6
F79
F80
J1016B
-13
-14
C2PUDC
when cassette 2 pick-up assembly door is closed, '1'.
Duplexing reversing assembly door switch (CLC800)
SW7
F83
F84
J1023A
-8
-7
RVDC
when duplexing reversing assembly door is closed, '1'.
Duplexing pick-up assembly door switch (CLC800 only)
SW8
F81
F82
J1021A
-2
-1
RVPUDC
when duplexing pick-up assembly door is closed, '1'.
Waste toner feeding screw lock detection switch
MS4
F73
F74
J1013A
-8
-7
WTBD
when waste toner clogging is detected, '1'.
Pre-photosensitive drum cleaner paper sensor
PS43
J353
-5
-4
-3
-2
-1
J1039
-1
-2
-3
-4
-5
LED
PS43D
+8V
CONNECT

Figure 3-112

Outputs from the DC Controller (1/10)


DC controller PCB
J1004 -2
SHUTOFF*
Main switch
SW1
Reactor (115V only)
DCP1 (main power supply PCB)
24V
J1031 -9
Power supply cooling fan
24V
FM8
24V
J1031 -10
FANERR
when FM8 on DCP1 is not rotating, '1'.
Left door SW SW4
Delivery door SW SW5
RL1
RL2
SSR1
J704 -1 -2 -3 -4 -5
J1012 -4 -5 -6 -7 -8
USSRD
UHON
LHON
LSSRD
See p. 3-165.
Power saving SW (See Note.)
SW10
SSR2
THS2
H1
Upper fixing heater
THM1
J1020B -8 -7
5V
THM1 (analog/input signal)
THS3
H2
Lower fixing heater
THM2
-6 -5
5V
THM2 (analog/input signal)
THS5
H5
Upper cassette heater (CLC700 only)
THS6
H6
Lower cassette heater (CLC800 only)
Duplexing assembly door SW
SW9
THS4
H3
Duplexing stacking assembly heater (CLC800 only)
DCP2
DCP2 (options power supply PCB)
Lamp regulator
Drum heater controller PCB
THM3
H4
J1034 -1 -2 -3
DRHOFF
DRHERR

Note : The cassette heaters and drum heater remain on if SW10 is as indicated in the figure; when shifted down, it decomes synchronized with the main switch.

The heater in the duplexing unit stacking assembly always operates in conjunction with the main switch.

Figure 3-113

Outputs form the DC Controller (2/10)

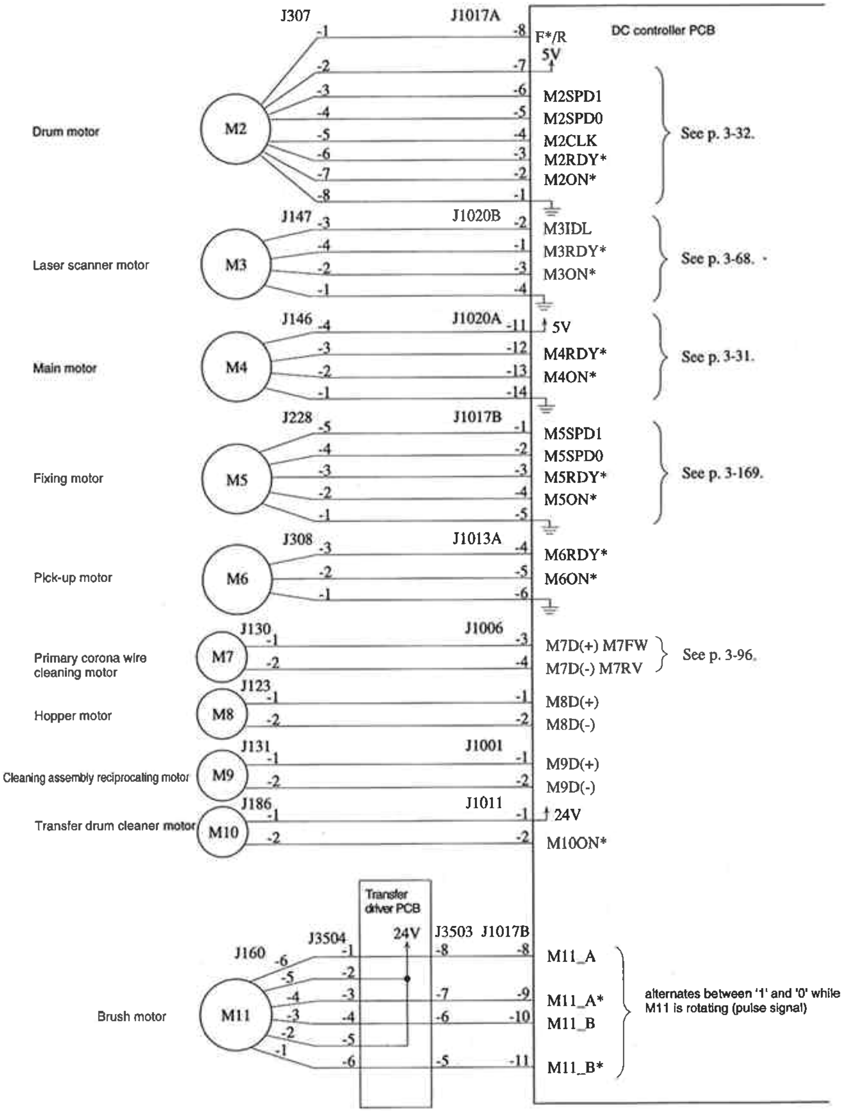

DC controller PCB
J307
J1017A
F*/R
5V
Drum motor
M2
M2SPD1
M2SPD0
M2CLK
M2RDY*
M2ON*
See p. 3-32.
J147
J1020B
Laser scanner motor
M3
M3IDL
M3RDY*
M3ON*
See p. 3-68.
J146
J1020A
Main motor
M4
5V
M4RDY*
M4ON*
See p. 3-31.
J228
J1017B
Fixing motor
M5
M5SPD1
M5SPD0
M5RDY*
M5ON*
See p. 3-169.
J308
J1013A
Pick-up motor
M6
M6RDY*
M6ON*
J130
J1006
Primary corona wire cleaning motor
M7
M7D(+) M7FW
M7D(-) M7RV
See p. 3-96.
J123
Hopper motor
M8
M8D(+)
M8D(-)
J131
J1001
Cleaning assembly reciprocating motor
M9
M9D(+)
M9D(-)
J186
J1011
Transfer drum cleaner motor
M10
24V
M10ON*
Transfer driver PCB
24V
J3504
J3503
J1017B
J160
Brush motor
M11
M11_A
M11_A*
M11_B
M11_B*
alternates between '1' and '0' while M11 is rotating (pulse signal)

Figure 3-114

Outputs from the DC Controller (3/10)

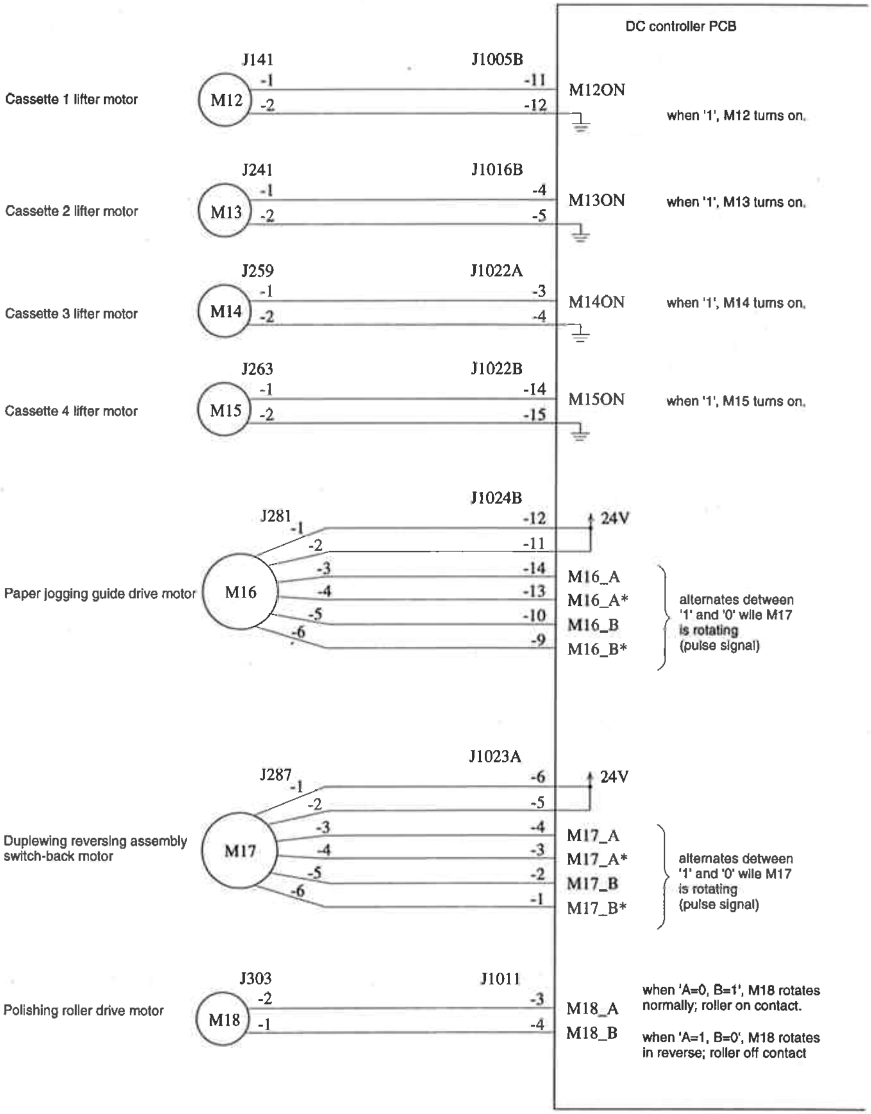

DC controller PCB
Cassette 1 lifter motor
M12
J141
-1
-2
J1005B
-11
-12
M12ON
when '1', M12 turns on.
Cassette 2 lifter motor
M13
J241
-1
-2
J1016B
-4
-5
M13ON
when '1', M13 turns on.
Cassette 3 lifter motor
M14
J259
-1
-2
J1022A
-3
-4
M14ON
when '1', M14 turns on.
Cassette 4 lifter motor
M15
J263
-1
-2
J1022B
-14
-15
M15ON
when '1', M15 turns on.
Paper jogging guide drive motor
M16
J281
-1
-2
-3
-4
-5
-6
J1024B
-12
-11
-14
-13
-10
-9
24V
M16_A
M16_A*
M16_B
M16_B*
alternates detween '1' and '0' wile M17 is rotating (pulse signal)
Duplewing reversing assembly switch-back motor
M17
J287
-1
-2
-3
-4
-5
-6
J1023A
-6
-5
-4
-3
-2
-1
24V
M17_A
M17_A*
M17_B
M17_B*
alternates detween '1' and '0' wile M17 is rotating (pulse signal)
Polishing roller drive motor
M18
J303
-2
-1
J1011
-3
-4
M18_A
M18_B
when 'A=0, B=1', M18 rotates normally; roller on contact.
when 'A=1, B=0', M18 rotates in reverse; roller off contact

Figure 3-115

Outputs from the DC Controller (4/10. TYPE1)

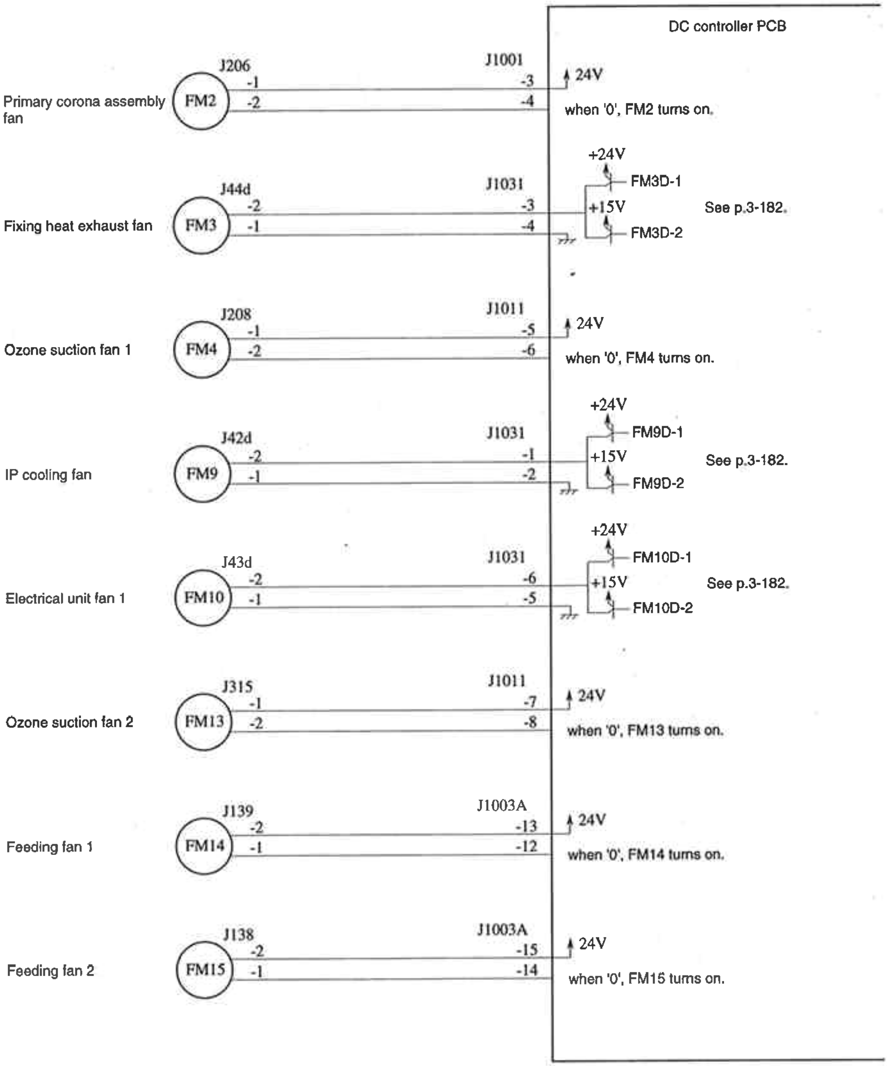
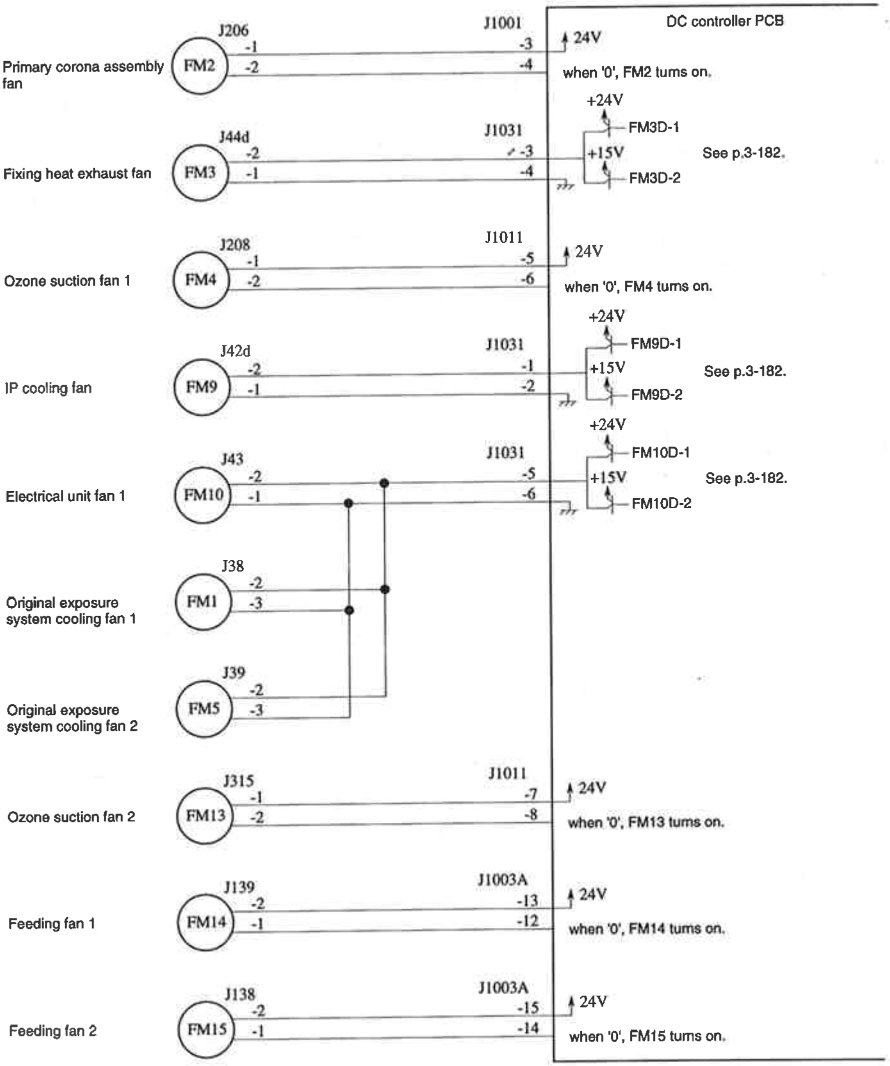

DC controller PCB
Primary corona assembly fan
FM2
J206
-1
-2
J1001
-3
-4
24V
when '0', FM2 turns on.
Fixing heat exhaust fan
FM3
J44d
-2
-1
J1031
-3
-4
+24V
FM3D-1
+15V
FM3D-2
See p.3-182.
Ozone suction fan 1
FM4
J208
-1
-2
J1011
-5
-6
24V
when '0', FM4 turns on.
IP cooling fan
FM9
J42d
-2
-1
J1031
-1
-2
+24V
FM9D-1
+15V
FM9D-2
See p.3-182.
Electrical unit fan 1
FM10
J43d
-2
-1
J1031
-6
-5
+24V
FM10D-1
+15V
FM10D-2
See p.3-182.
Ozone suction fan 2
FM13
J315
-1
-2
J1011
-7
-8
24V
when '0', FM13 turns on.
Feeding fan 1
FM14
J139
-2
-1
J1003A
-13
-12
24V
when '0', FM14 turns on.
Feeding fan 2
FM15
J138
-2
-1
J1003A
-15
-14
24V
when '0', FM15 turns on.

Figure 3-116A

Outputs from the DC Controller (4/10. TYPE2)


DC controller PCB
Primary corona assembly fan
FM2
J206
-1
-2
J1001
-3
-4
24V
when '0', FM2 turns on.
Fixing heat exhaust fan
FM3
J44d
-2
-1
J1031
-3
-4
+24V
FM3D-1
+15V
FM3D-2
See p.3-182.
Ozone suction fan 1
FM4
J208
-1
-2
J1011
-5
-6
24V
when '0', FM4 turns on.
IP cooling fan
FM9
J42d
-2
-1
J1031
-1
-2
+24V
FM9D-1
+15V
FM9D-2
See p.3-182.
Electrical unit fan 1
FM10
J43
-2
-1
J1031
-5
-6
+24V
FM10D-1
+15V
FM10D-2
See p.3-182.
Original exposure system cooling fan 1
FM1
J38
-2
-3
Original exposure system cooling fan 2
FM5
J39
-2
-3
Ozone suction fan 2
FM13
J315
-1
-2
J1011
-7
-8
24V
when '0', FM13 turns on.
Feeding fan 1
FM14
J139
-2
-1
J1003A
-13
-12
24V
when '0', FM14 turns on.
Feeding fan 2
FM15
J138
-2
-1
J1003A
-15
-14
24V
when '0', FM15 turns on.

For FM8, see Figure 3-113.
For FM12, see Figure 3-122.

Figure 3-116B

Outputs from the DC Controller (5/10)

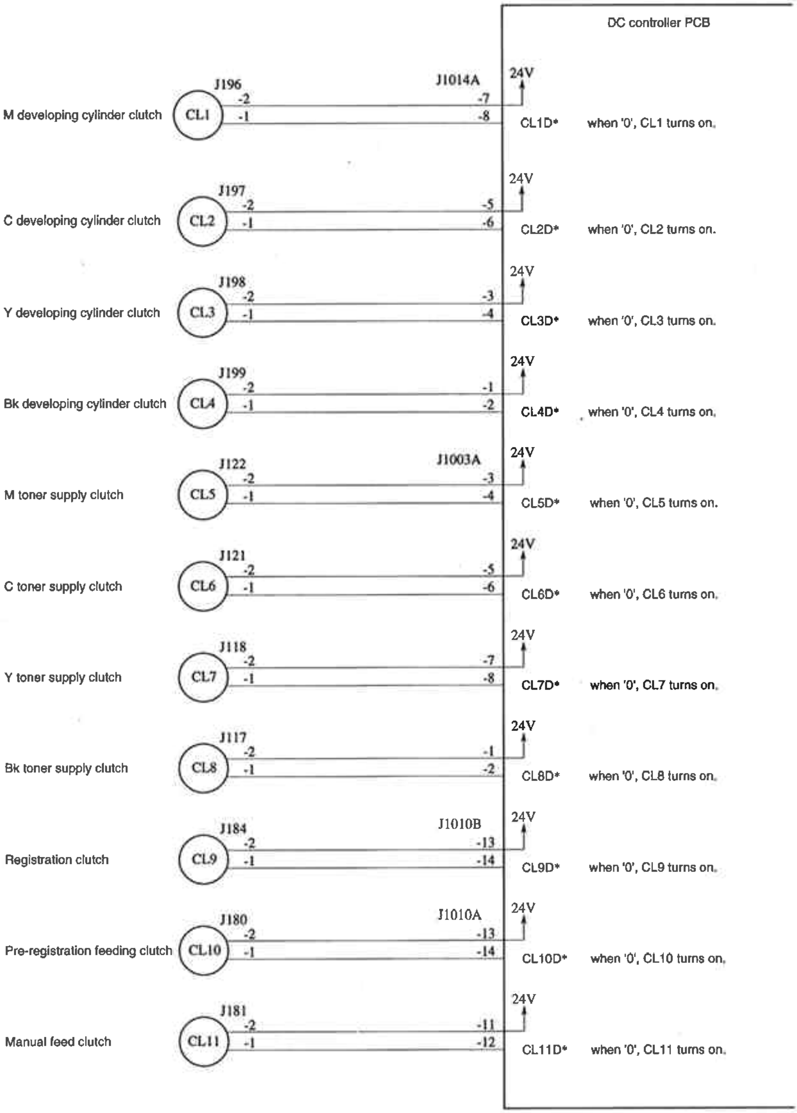

DC controller PCB
J196
J1014A
24V
-2
-7
M developing cylinder clutch
CL1
-1
-8
CL1D*
when '0', CL1 turns on.
J197
24V
-2
-5
C developing cylinder clutch
CL2
-1
-6
CL2D*
when '0', CL2 turns on.
J198
24V
-2
-3
Y developing cylinder clutch
CL3
-1
-4
CL3D*
when '0', CL3 turns on.
J199
24V
-2
-1
Bk developing cylinder clutch
CL4
-1
-2
CL4D*
when '0', CL4 turns on.
J122
J1003A
24V
-2
-3
M toner supply clutch
CL5
-1
-4
CL5D*
when '0', CL5 turns on.
J121
24V
-2
-5
C toner supply clutch
CL6
-1
-6
CL6D*
when '0', CL6 turns on.
J118
24V
-2
-7
Y toner supply clutch
CL7
-1
-8
CL7D*
when '0', CL7 turns on.
J117
24V
-2
-1
Bk toner supply clutch
CL8
-1
-2
CL8D*
when '0', CL8 turns on.
J184
J1010B
24V
-2
-13
Registration clutch
CL9
-1
-14
CL9D*
when '0', CL9 turns on.
J180
J1010A
24V
-2
-13
Pre-registration feeding clutch
CL10
-1
-14
CL10D*
when '0', CL10 turns on.
J181
24V
-2
-11
Manual feed clutch
CL11
-1
-12
CL11D*
when '0', CL11 turns on.

Figure 3-117

Outputs from the DC Controller (6/10)

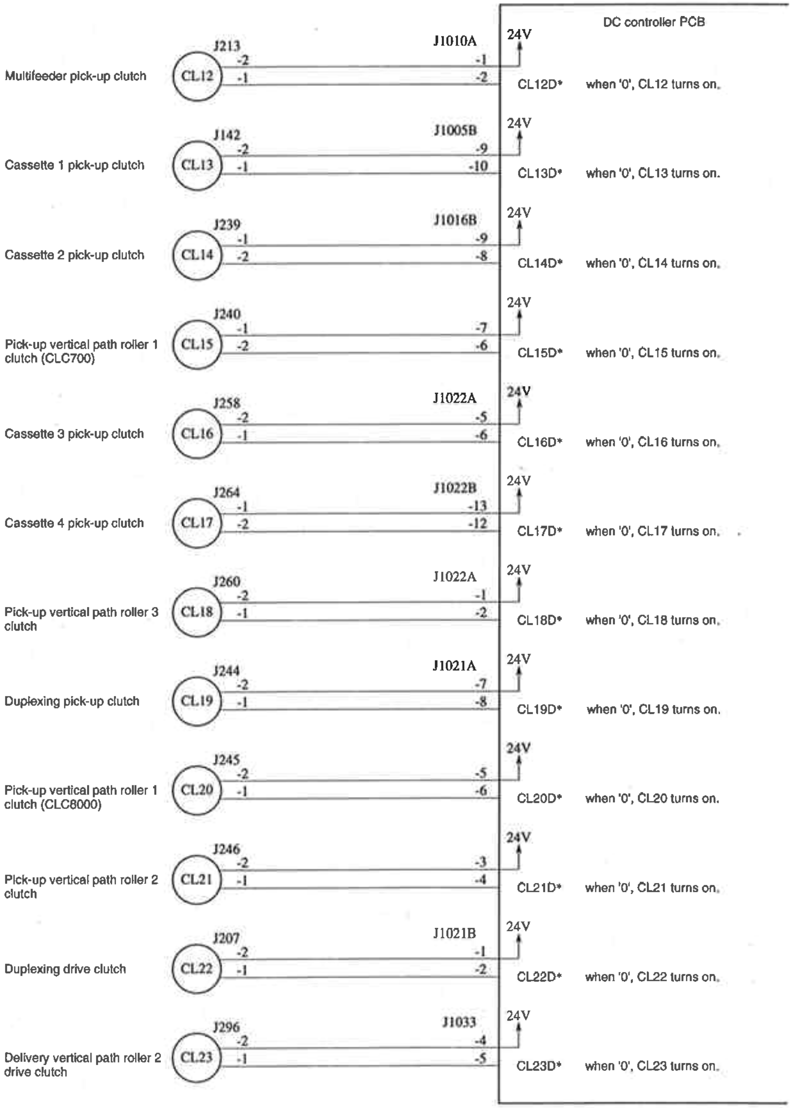

DC controller PCB
Multifeeder pick-up clutch
CL12
J213
-2
-1
J1010A
-1
-2
24V
CL12D*
when '0', CL12 turns on.
Cassette 1 pick-up clutch
CL13
J142
-2
-1
J1005B
-9
-10
24V
CL13D*
when '0', CL13 turns on.
Cassette 2 pick-up clutch
CL14
J239
-1
-2
J1016B
-9
-8
24V
CL14D*
when '0', CL14 turns on.
Pick-up vertical path roller 1 clutch (CLC700)
CL15
J240
-1
-2
-7
-6
24V
CL15D*
when '0', CL15 turns on.
Cassette 3 pick-up clutch
CL16
J258
-2
-1
J1022A
-5
-6
24V
CL16D*
when '0', CL16 turns on.
Cassette 4 pick-up clutch
CL17
J264
-1
-2
J1022B
-13
-12
24V
CL17D*
when '0', CL17 turns on.
Pick-up vertical path roller 3 clutch
CL18
J260
-2
-1
J1022A
-1
-2
24V
CL18D*
when '0', CL18 turns on.
Duplexing pick-up clutch
CL19
J244
-2
-1
J1021A
-7
-8
24V
CL19D*
when '0', CL19 turns on.
Pick-up vertical path roller 1 clutch (CLC8000)
CL20
J245
-2
-1
-5
-6
24V
CL20D*
when '0', CL20 turns on.
Pick-up vertical path roller 2 clutch
CL21
J246
-2
-1
-3
-4
24V
CL21D*
when '0', CL21 turns on.
Duplexing drive clutch
CL22
J207
-2
-1
J1021B
-1
-2
24V
CL22D*
when '0', CL22 turns on.
Delivery vertical path roller 2 drive clutch
CL23
J296
-2
-1
J1033
-4
-5
24V
CL23D*
when '0', CL23 turns on.

Figure 3-118

Outputs from the DC Controller (7/10)

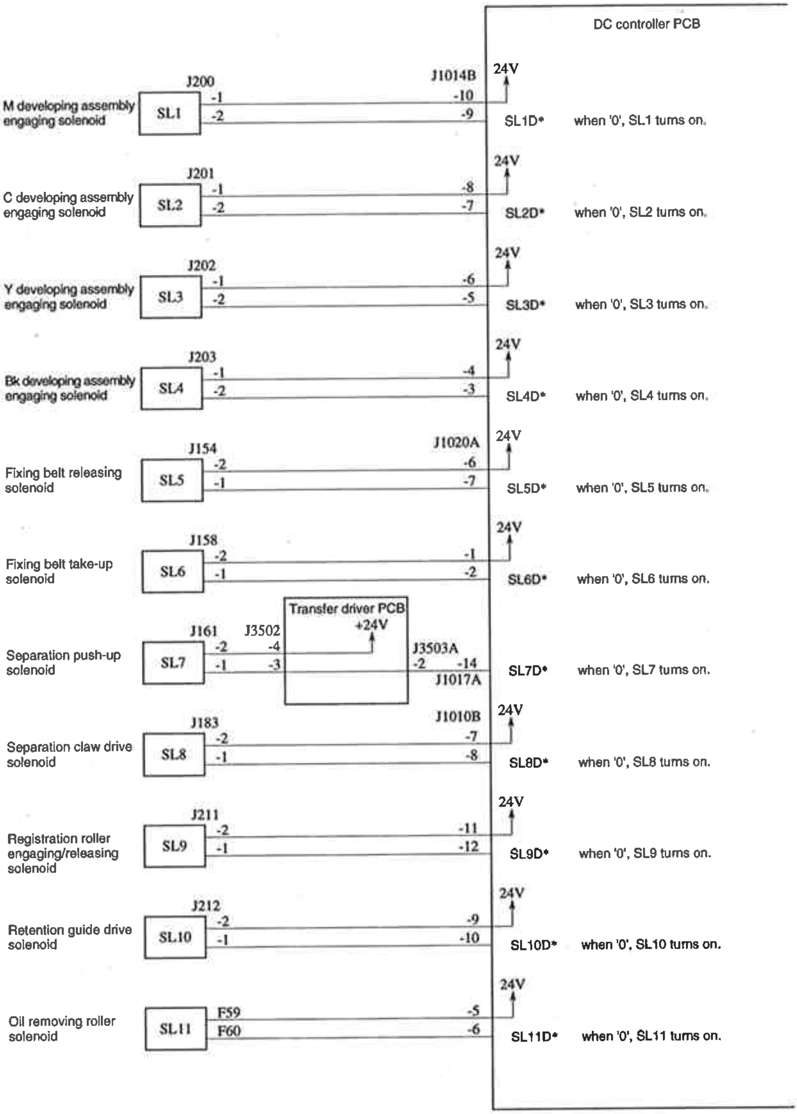

DC controller PCB
M developing assembly engaging solenoid
SL1
J200
-1
-2
J1014B
-10
-9
24V
SL1D*
when '0', SL1 turns on.
C developing assembly engaging solenoid
SL2
J201
-1
-2
-8
-7
24V
SL2D*
when '0', SL2 turns on.
Y developing assembly engaging solenoid
SL3
J202
-1
-2
-6
-5
24V
SL3D*
when '0', SL3 turns on.
Bk developing assembly engaging solenoid
SL4
J203
-1
-2
-4
-3
24V
SL4D*
when '0', SL4 turns on.
Fixing belt releasing solenoid
SL5
J154
-2
-1
J1020A
-6
-7
24V
SL5D*
when '0', SL5 turns on.
Fixing belt take-up solenoid
SL6
J158
-2
-1
-1
-2
24V
SL6D*
when '0', SL6 turns on.
Separation push-up solenoid
SL7
J161
-2
-1
J3502
-4
-3
Transfer driver PCB
+24V
J3503A
-2
-14
J1017A
SL7D*
when '0', SL7 turns on.
Separation claw drive solenoid
SL8
J183
-2
-1
J1010B
-7
-8
24V
SL8D*
when '0', SL8 turns on.
Registration roller engaging/releasing solenoid
SL9
J211
-2
-1
-11
-12
24V
SL9D*
when '0', SL9 turns on.
Retention guide drive solenoid
SL10
J212
-2
-1
-9
-10
24V
SL10D*
when '0', SL10 turns on.
Oil removing roller solenoid
SL11
F59
F60
-5
-6
24V
SL11D*
when '0', SL11 turns on.

Figure 3-119

Outputs from the DC Controller (8/10)

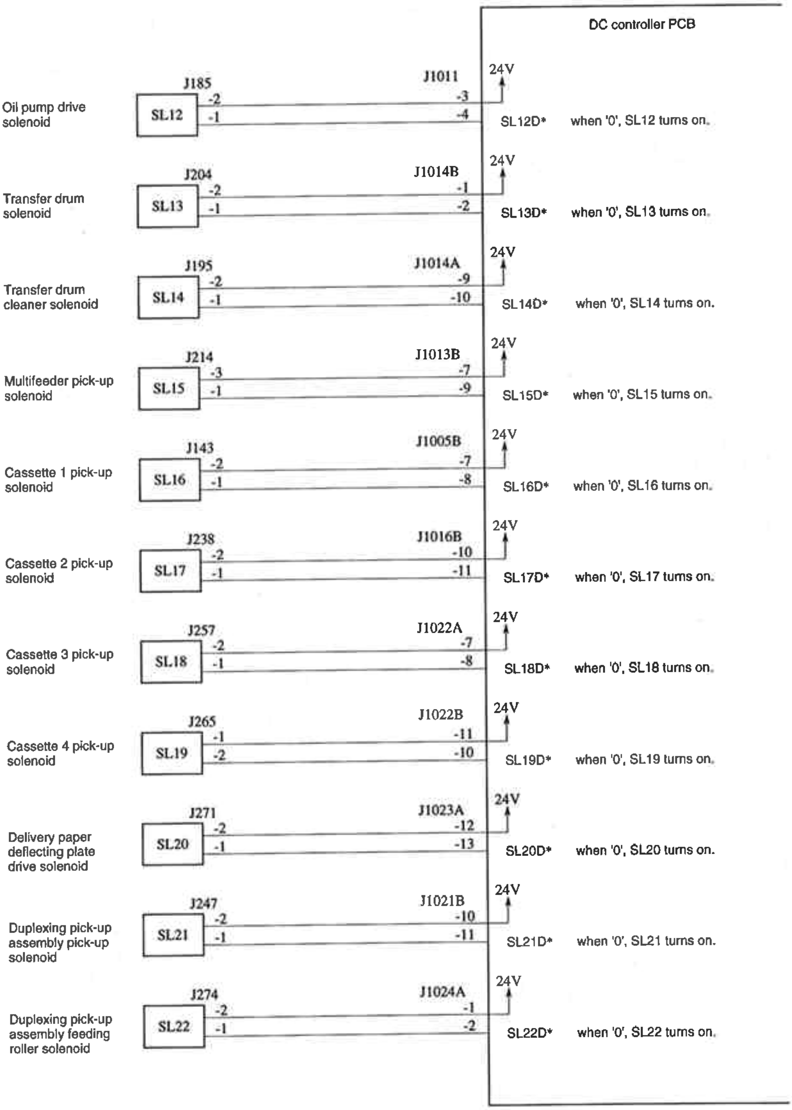

DC controller PCB
Oil pump drive solenoid
SL12
J185
-2
-1
J1011
-3
-4
24V
SL12D*
when '0', SL12 turns on.
Transfer drum solenoid
SL13
J204
-2
-1
J1014B
-1
-2
24V
SL13D*
when '0', SL13 turns on.
Transfer drum cleaner solenoid
SL14
J195
-2
-1
J1014A
-9
-10
24V
SL14D*
when '0', SL14 turns on.
Multifeeder pick-up solenoid
SL15
J214
-3
-1
J1013B
-7
-9
24V
SL15D*
when '0', SL15 turns on.
Cassette 1 pick-up solenoid
SL16
J143
-2
-1
J1005B
-7
-8
24V
SL16D*
when '0', SL16 turns on.
Cassette 2 pick-up solenoid
SL17
J238
-2
-1
J1016B
-10
-11
24V
SL17D*
when '0', SL17 turns on.
Cassette 3 pick-up solenoid
SL18
J257
-2
-1
J1022A
-7
-8
24V
SL18D*
when '0', SL18 turns on.
Cassette 4 pick-up solenoid
SL19
J265
-1
-2
J1022B
-11
-10
24V
SL19D*
when '0', SL19 turns on.
Delivery paper deflecting plate drive solenoid
SL20
J271
-2
-1
J1023A
-12
-13
24V
SL20D*
when '0', SL20 turns on.
Duplexing pick-up assembly pick-up solenoid
SL21
J247
-2
-1
J1021B
-10
-11
24V
SL21D*
when '0', SL21 turns on.
Duplexing pick-up assembly feeding roller solenoid
SL22
J274
-2
-1
J1024A
-1
-2
24V
SL22D*
when '0', SL22 turns on.

Figure 3-120

Outputs from the DC Controller (9/10)

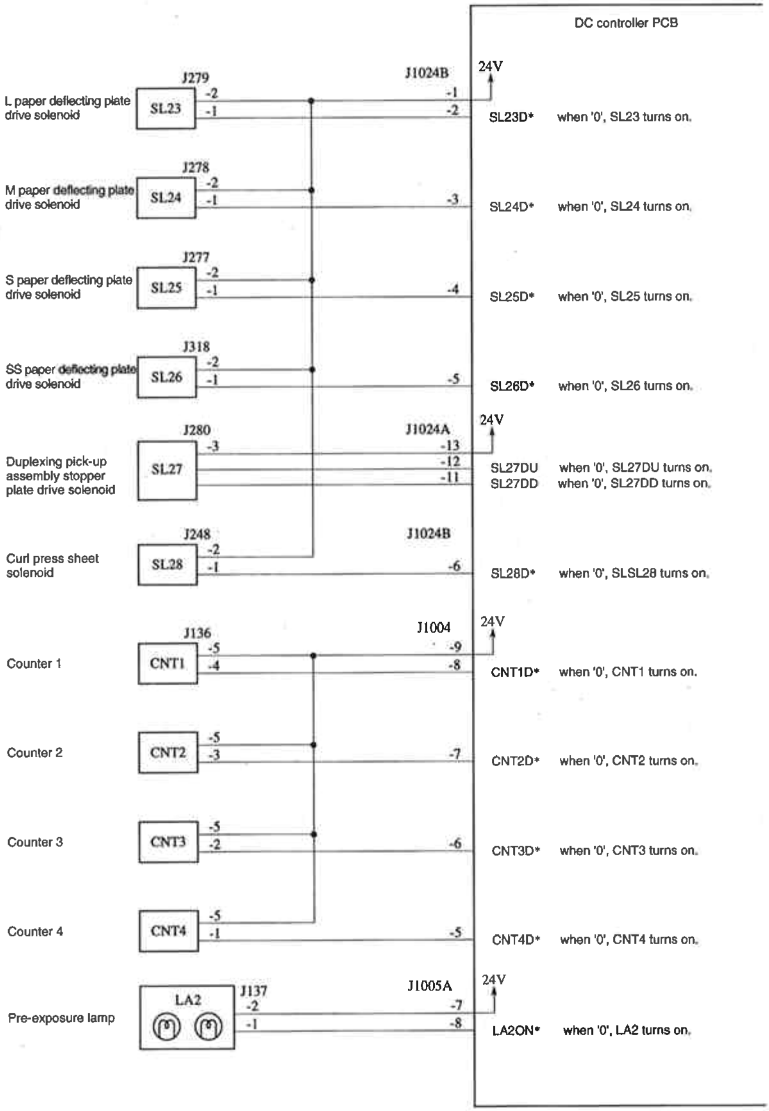

DC controller PCB
24V
J279
J1024B
L paper deflecting plate drive solenoid
SL23
-2
-1
-1
-2
SL23D*
when '0', SL23 turns on.
J278
M paper deflecting plate drive solenoid
SL24
-2
-1
-3
SL24D*
when '0', SL24 turns on.
J277
S paper deflecting plate drive solenoid
SL25
-2
-1
-4
SL25D*
when '0', SL25 turns on.
J318
SS paper deflecting plate drive solenoid
SL26
-2
-1
-5
SL26D*
when '0', SL26 turns on.
24V
J280
J1024A
Duplexing pick-up assembly stopper plate drive solenoid
SL27
-3
-13
-12
-11
SL27DU
SL27DD
when '0', SL27DU turns on.
when '0', SL27DD turns on.
J248
J1024B
Curl press sheet solenoid
SL28
-2
-1
-6
SL28D*
when '0', SLSL28 turns on.
24V
J136
J1004
Counter 1
CNT1
-5
-4
-9
-8
CNT1D*
when '0', CNT1 turns on.
Counter 2
CNT2
-5
-3
-7
CNT2D*
when '0', CNT2 turns on.
Counter 3
CNT3
-5
-2
-6
CNT3D*
when '0', CNT3 turns on.
Counter 4
CNT4
-5
-1
-5
CNT4D*
when '0', CNT4 turns on.
24V
J137
J1005A
Pre-exposure lamp
LA2
-2
-1
-7
-8
LA2ON*
when '0', LA2 turns on.

Figure 3-121

Outputs from the DC Controller (10/10)

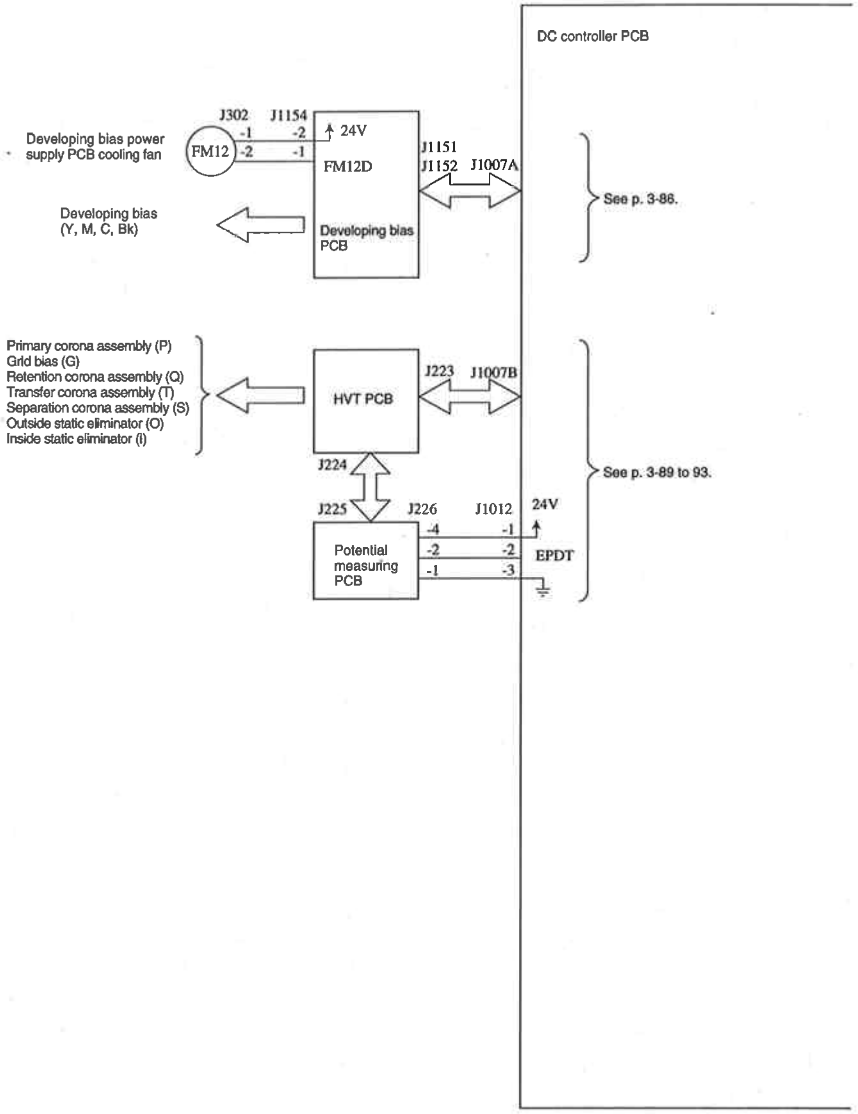

DC controller PCB
Developing bias power supply PCB cooling fan
FM12
J302
-1
-2
J1154
-2
-1
24V
FM12D
Developing bias PCB
J1151
J1152
J1007A
See p. 3-86.
Developing bias (Y, M, C, Bk)
Primary corona assembly (P)
Grid bias (G)
Retention corona assembly (Q)
Transfer corona assembly (T)
Separation corona assembly (S)
Outside static eliminator (O)
Inside static eliminator (I)
HVT PCB
J223
J1007B
J224
J225
J226
J1012
24V
-4
-2
-1
-1
-2
-3
EPDT
Potential measuring PCB
See p. 3-89 to 93.

Figure 3-122

D. Basic Sequence of Operations

1. Sequence at Power-On

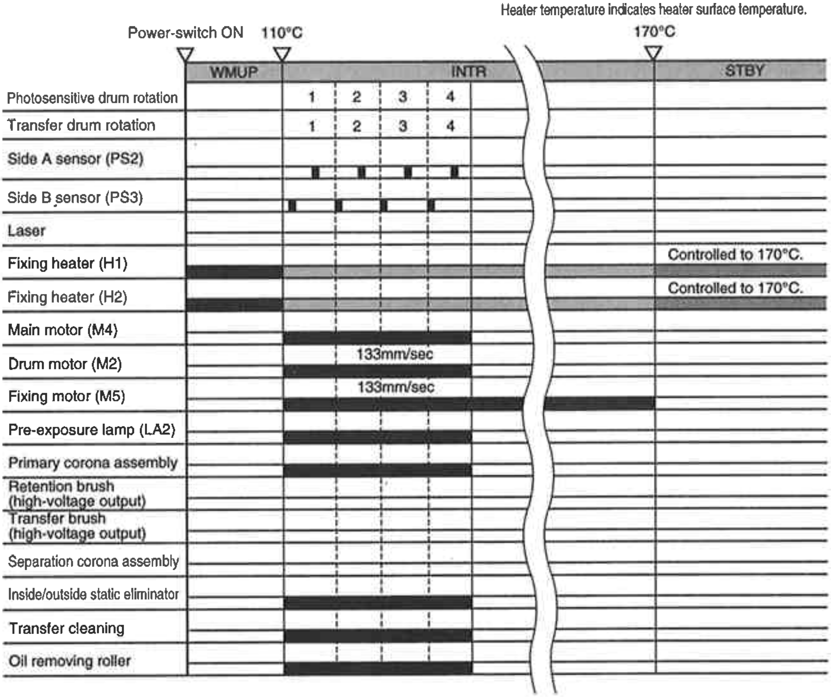


Figure 3-123 Sequence at Power-On

a. The copying operations are based on the side A sensor and the side B sensor used to detect the position of the transfer drum. For control executed based on other signals, see the respective timing charts.

b. The outside diameter of the transfer drum is the same as that of the photosensitive drum, and both drums come into contact with each other as necessary (copying) the photosensitive drum makes a single rotation for each rotation of the transfer drum.

c. The fixing temperature indicates the surface temperature of the fixing roller, i.e., the value indicated under ANALOG of DISPLAY in service mode (temperature detected by a thermistor).

Period		Description	Remarks
WMUP (warm-up)	Between when the power switch has been turned on and when the surface temperature of the upper fixing roller reaches 110°C.	Waits from the fixing roller to warm up.	
INTR (additional rotation)	Between when the surface temperature of the upper fixing roller has reached 110°C and when it reaches 160°C.		
STBY (standby)	Between when INTR is over and when the Copy Start key is pressed or the Power switch is turned off.	Waits for a press on the Copy Start key or any other operation key.	

Table 3-101

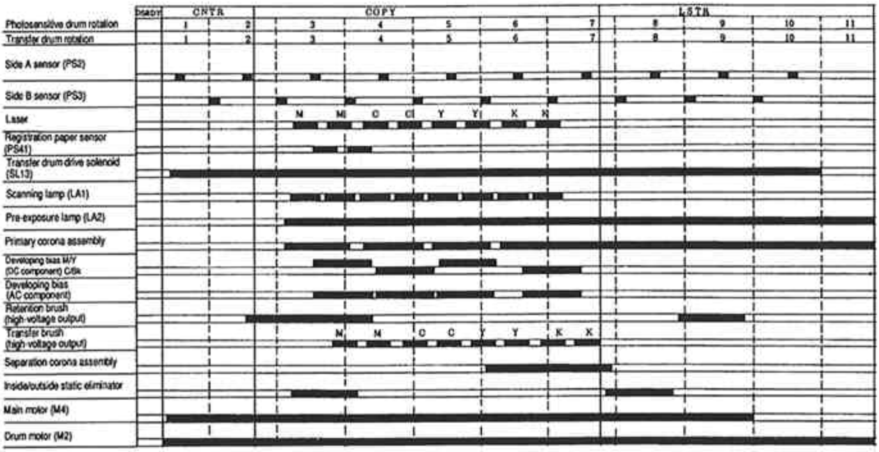

DSRDY
CNTR
COPY
LSTR
Photosensitive drum rotation
Transfer drum rotation
1
2
3
4
5
6
7
8
9
10
11
Side A sensor (PS2)
Side B sensor (PS3)
Laser
M
M
C
C
Y
Y
K
K
Registration paper sensor (PS41)
Transfer drum drive solenoid (SL13)
Scanning lamp (LA1)
Pre-exposure lamp (LA2)
Primary corona assembly
Developing bias M/Y (DC component) C/Bk
Developing bias (AC component)
Retention brush (high-voltage output)
Transfer brush (high-voltage output)
M
M
C
C
Y
Y
K
K
Separation corona assembly
Inside/outside static eliminator
Main motor (M4)
Drum motor (M2)

Figure 3-124 (A4/LTR, 2 copies, DIRECT, cassette 1)

Period		Description	Remarks
DSRDY (scanner ready)	Between when the Copy Start key has been pressed and when the transfer drum starts to rotate.	Executes a document detection scan. Executes shading correction.	
CNTR (control rotation)	Between when the DSRDY is over and when attraction of copy paper starts.	Measures and controls the surface potential of the drum.	
COPY (copy)	Between when the transfer drum starts to attract copy paper and when all toner has been trasferred to the copy paper.	Turns on and off the laser beam based on the video signals, develops specified colors, and transfers.	
LSTR (post rotation)	Between when COPY ends and when the drum motor stops.	Discharges copy paper. Stabilizes the sensitivity of the photosensitive drum. Discharges the transfer drum (cleaning).	

Table 3-102

E. Generating the Image Leading Edge Signal

1. Outline

The copier controls sequences of copying operations with reference to the leading edge of copy paper on the transfer drum.

Figure 3-125 shows the position of copy paper at the time the image leading edge signal is generated within the transfer drum.

The distance between the point of laser exposure and the point of transfer on the photosensitive drum (a) and the leading edge of copy paper and the point of transfer on the transfer drum (b) are equal.

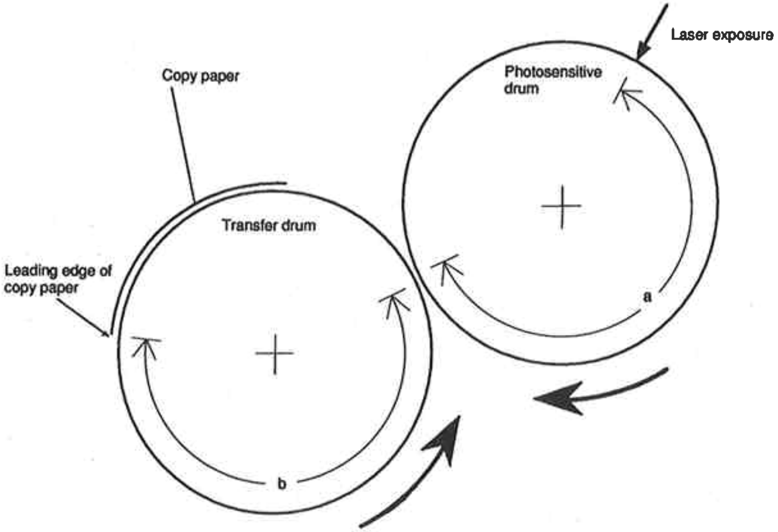

Laser exposure
Copy paper
Photosensitive drum
Transfer drum
Leading edge of copy paper
a
b

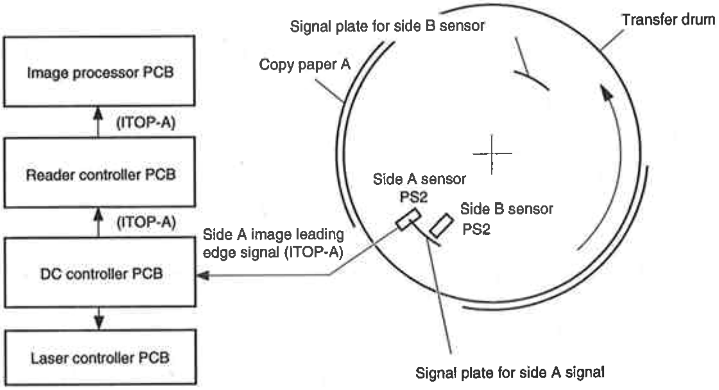
Figure 3-125

2. Controlling Side A and Side B

The copier must deposit a maximum of four different colors (toner) on the same spot; to ensure correct deposits of toner, it controls the original exposure, image processing, laser exposure, high voltage, and feeding sequences with reference to the leading edge of copy paper.

A maximum of two sheets of copy paper are retained on the transfer drum at the same time, and the sensor (PS2, side A sensor; PS3, side B sensor) inside the transfer drum unit and the two signal plates that operate in connection with the transfer drum are used to generate the image leading edge signal (ITOP-A, ITOP-B) for each sheet of copy paper.

- Transfer Drum When Copying on Side A


Signal plate for side B sensor
Transfer drum
Image processor PCB
Copy paper A
(ITOP-A)
Reader controller PCB
Side A sensor
PS2
Side B sensor
PS2
(ITOP-A)
Side A image leading
edge signal (ITOP-A)
DC controller PCB
Laser controller PCB
Signal plate for side A signal

- Transfer Drum When Copying on Side B

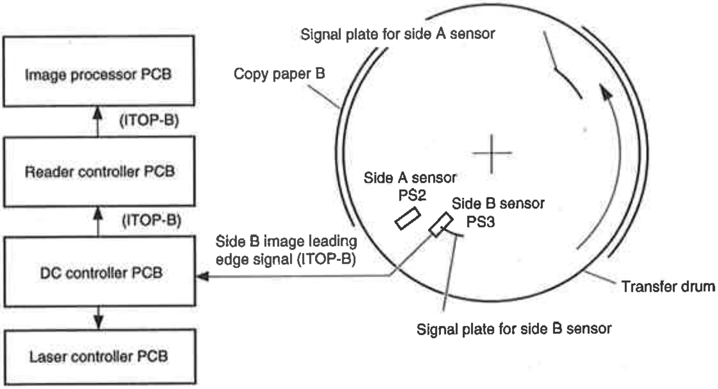

Signal plate for side A sensor
Image processor PCB
Copy paper B
(ITOP-B)
Reader controller PCB
Side A sensor
PS2
Side B sensor
PS3
(ITOP-B)
Side B image leading
edge signal (ITOP-B)
DC controller PCB
Transfer drum
Signal plate for side B sensor
Laser controller PCB

Figure 3-126

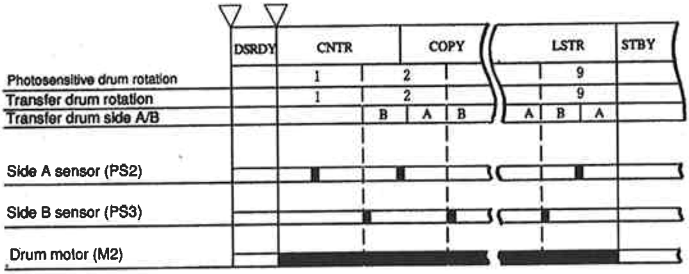

DSRDY
CNTR
COPY
LSTR
STBY
Photosensitive drum rotation
Transfer drum rotation
Transfer drum side A/B
1
2
9
B
A
B
A
B
A
Side A sensor (PS2)
Side B sensor (PS3)
Drum motor (M2)

Figure 3-127

Figure 3-128 shows the way copy paper is retained on the transfer drum in each copy mode. In mono color mode, paper is retained in the same way as M for C, Y, and Bk.

Small size paper ....216 mm or less in feeding direction (A4/LTR or less)
Large size ....217 mm or more in feeding direction
2/M ....2, second sheet of paper; M, M-color development

- In the table, the small and large sizes do not necessarily represent the size notations used in relation to the cassettes.
- When copies are made on small-size paper without potential measurement, CNTR ends earlier* and copying starts on side B.

*Equivalent of a 0.5 rotation in relation to the transfer drum.

CNTR end
▽

Transfer drum rotation		2	3	4	5	6	7	8	9	10	11	12	13	14
Copy paper leading edge		BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
Mono (M)	Small (5 sheets)	1/M 2/M	3/M 4/M	5/M										
	Large (3 sheets)	1/M	2/M	3/M										
3-color (MCY)	Small (5 sheets)	1/M 2/M	1/C 2/C	1/Y 2/Y	3/M 4/M	3/C 4/C	3/Y 4/Y	5/M	5/C	5/Y				
	Large (3 sheets)	1/M	1/C	1/Y	2/M	2/C	2/Y	3/M	3/C	3/Y				
4-color (MCYBk)	Small (5 sheets)	1/M 2/M	1/C 2/C	1/Y 2/Y	1/Bk 2/Bk	3/M 4/M	3/C 4/C	3/Y 4/Y	3/Bk 4/Bk	5/M	5/C	5/Y	5/Bk	
	Large (3 sheets)	1/M	1/C	1/Y	1/Bk	2/M	2/C	2/Y	2/Bk	3/M	3/C	3/Y	3/Bk	

Figure 3-128

F. Main Motor

The main motor (M4) is a brushlesss DC motor equipped with a built-in rotation speed control circuit. It rotates at a specific speed when the DC controller PCB causes the main motor drive signal (M4ON*) to go '0'.

If the rotation speed of the motor deviates for some reason, the motor causes the main motor ready signal (M4RDY*) to go '1', and the DC controller PCB indicates 'E010' on the control panel.

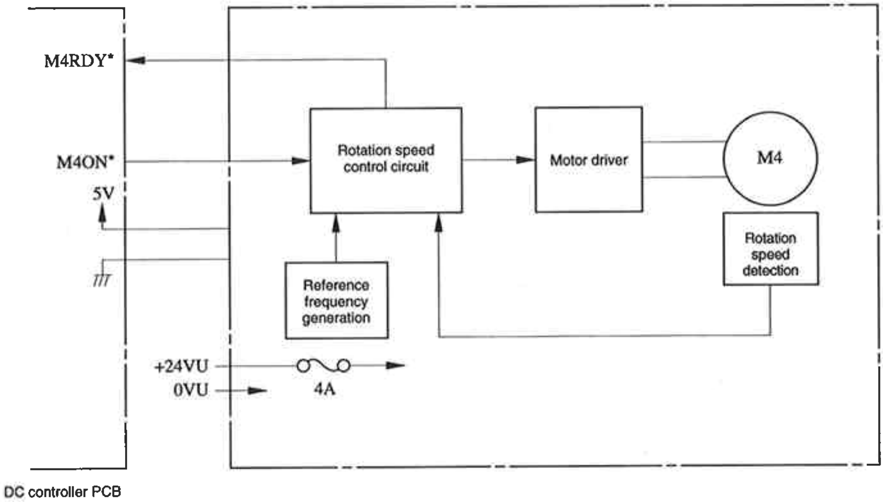

M4RDY*
M4ON*
5V
Rotation speed control circuit
Motor driver
M4
Rotation speed detection
Reference frequency generation
+24VU
0VU
4A
DC controller PCB

Figure 3-129

G. Drum Motor

The transfer drum motor (M2) is a brushless DC motor equipped with a rotation speed control circuit. It rotates at a specific speed when the DC controller PCB causes the drum motor drive signal (M2ON*) to go '0'.

The drum motor is controlled to four different speeds according to two speed control signals (M2SPD0, M2SPD1) generated by the DC controller PCB.

The DC controller PCB monitors the rotation detection signal (M2CLK) while the drum motor is rotating; if the speed deviates for some reason, the motor causes the drum motor ready signal (M2RDY) to go '1', and the DC controller PCB indicates 'E012' on the control panel.

Reference:

The copier controls the fixing speed in four stages to ensure proper fixing when making two-sided copies and using thick paper or transparencies. In addition, since the feeding path between the transfer drum and fixing unit is short, the drum motor must also be controlled to four speeds according to the fixing speeds. (See p. 3-169.)

	M2SPD0	M2SPD1
Normal	0	0
Duplexing	0	1
Thick paper	1	0
Transparency	1	1

Table 3-103

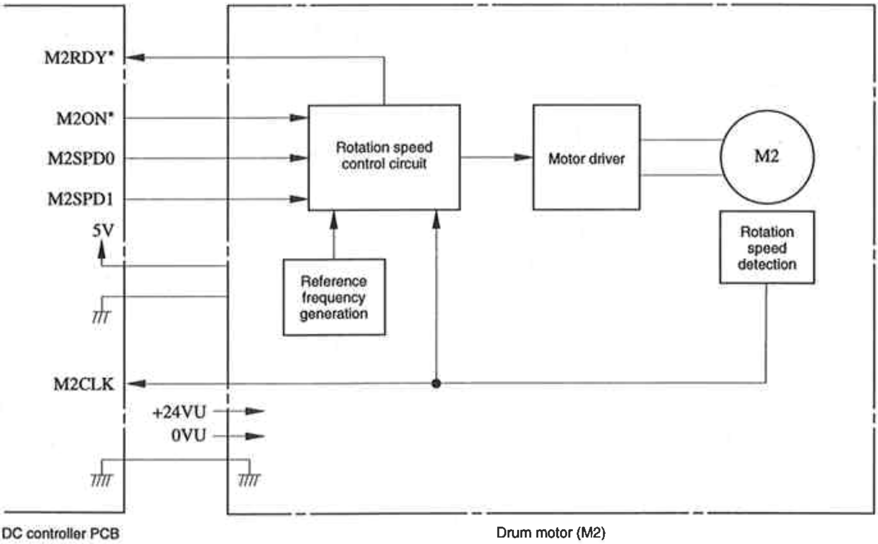

M2RDY*
M2ON*
M2SPD0
M2SPD1
5V
M2CLK
+24VU
0VU
Rotation speed control circuit
Motor driver
M2
Rotation speed detection
Reference frequency generation
DC controller PCB
Drum motor (M2)

Figure 3-130

II. ORIGINAL EXPOSURE SYSTEM

A. Outline

The original exposure system refers to the functions involving those processes executed between when an original is exposed and when the reflected light is directed to the CCD. See Figure 3-201 for a cross section of the original exposure system and Figure 3-202 for its external view.

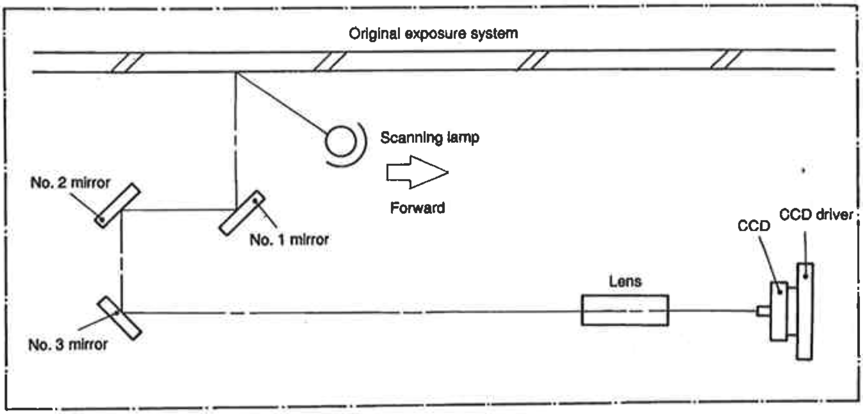

Original exposure system
Scanning lamp
Forward
No. 2 mirror
No. 1 mirror
CCD
CCD driver
Lens
No. 3 mirror

Figure 3-201

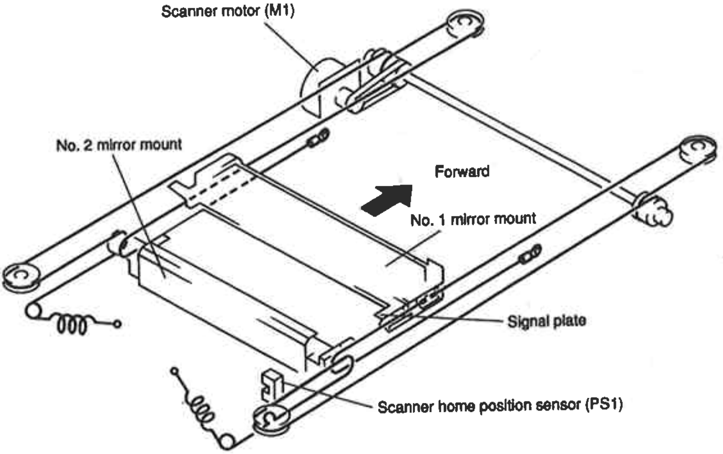
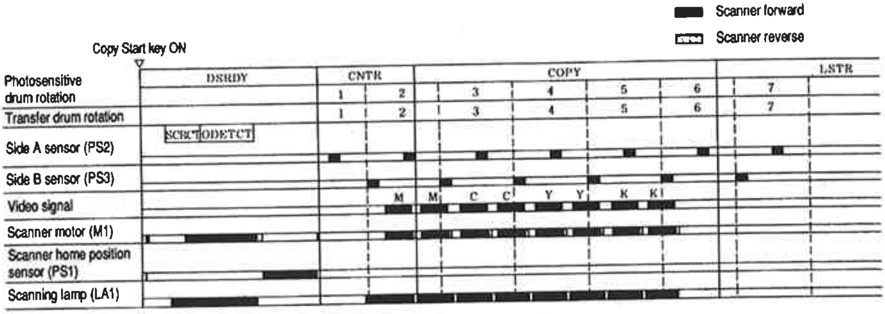

Scanner motor (M1)
No. 2 mirror mount
Forward
No. 1 mirror mount
Signal plate
Scanner home position sensor (PS1)

Figure 3-202

B. Basic Sequence of Exposing Originals

1. Sequence


Scanner forward
Scanner reverse
Copy Start key ON
Photosensitive drum rotation
Transfer drum rotation
Side A sensor (PS2)
Side B sensor (PS3)
Video signal
Scanner motor (M1)
Scanner home position sensor (PS1)
Scanning lamp (LA1)
DSRDY
CNTR
COPY
LSTR
1
2
3
4
5
6
7
SCRCT
ODETCT
M
M
C
C
Y
Y
K
K

SCRCT: Measures the shading correction position.
ODETCT: Identifies the document position, black original, and executes AE measurement.

Figure 3-203 (A4/LTR, 2 copies, 4 colors, DIRECT, cassette 1)

2. Scanner Home Position Sensor and Operation

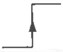
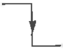
	Scanner Motor		Description
	Forward	Reverse	
Scanner home position sensor (PS1: SCHP)			Switches to forward.
			Moves forward by 1 mm, and stops; the point is used as the home position.

Table 3-201

The scanner home position sensor turns on only for the following conditions:

- at the start of copying operation.
- when all scans for the specified number of copies have been completed.
- during CCD adjustment.

The sensor does not turn on during continuous copying. Should it turn on because of an error, the ongoing original scan is stopped immediately. Figure 3-204 shows the movement of the scanner during copying operation; the start position is about 5 mm in the forward direction from the home position (DIRECT).

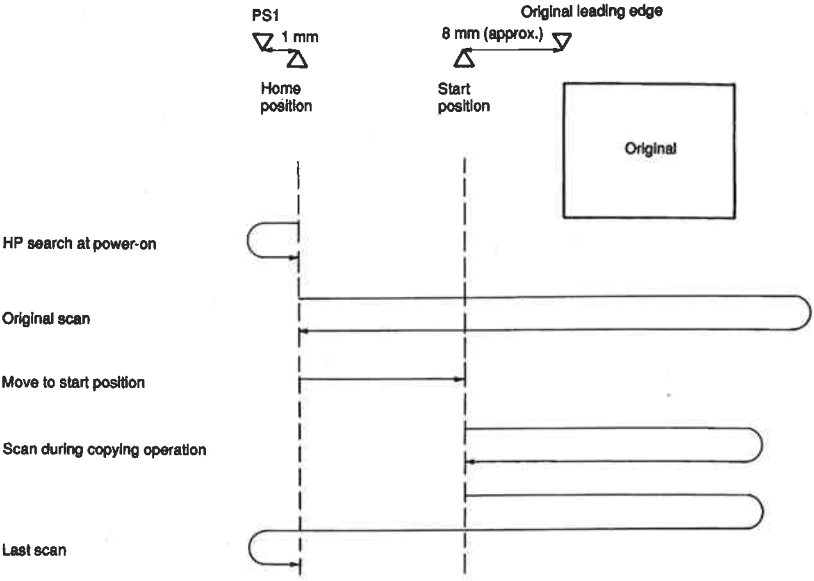

PS1
1 mm
Home position
Original leading edge
8 mm (approx.)
Start position
Original
HP search at power-on
Original scan
Move to start position
Scan during copying operation
Last scan

Figure 3-204

C. Original Scanner Motor

1. Outline

Figure 3-206 shows the circuit that controls the scanner motor with the following functions:

① Controls the rotation direction of the scanner motor.

② Controls the rotation speed of the scanner.

The original scanner motor changes its rotation direction depending on whether the scanner is moving forward or in reverse; the rotation speed when the scanner is moving forward varies depending on the selected reproduction ratio.

The rotation speed when the scanner is moving in reverse remains constant regardless of the selected reproduction ratio, and is about 10 times the speed at which it rotates when the scanner is moving forward (DIRECT), making reversal fast.

Reference:

When two sheets of copy paper is retained on the transfer drum, the distance between the two sheets is highly limited (as small as 66 mm); the scanner is moved at a speed that enables it to reverse within this short distance.

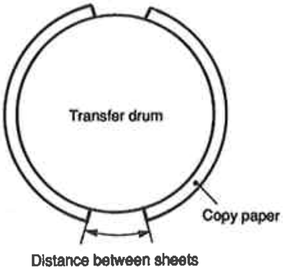

Transfer drum
Copy paper
Distance between sheets

Figure 3-205

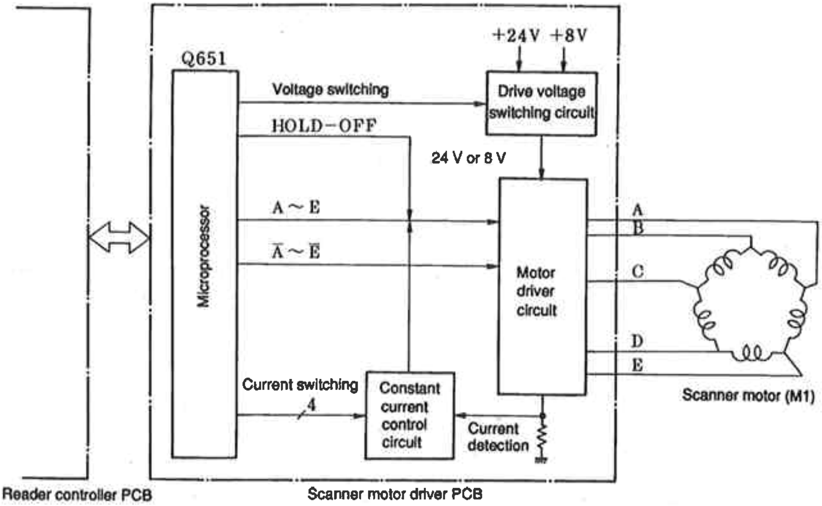

Q651
Microprocessor
Voltage switching
HOLD-OFF
A~E
Ā~Ē
Current switching
4
+24V +8V
Drive voltage switching circuit
24 V or 8 V
Motor driver circuit
Constant current control circuit
Current detection
A
B
C
D
E
Scanner motor (M1)
Reader controller PCB
Scanner motor driver PCB

Figure 3-206

2. Operation

The microprocessor (Q651) on the scanner motor driver PCB receives mode, distance, and reproduction ratio instructions for the scanner from the reader controller PCB. Upon receipt, it uses the instructions and drive pulses to the scanner motor. The scanner motor is a 5-phase stepping motor, and controls the direction and speed of the scanner by changing the sequence and frequency of drive pulses (A through E).

The drive voltage switching circuit switches the power used to drive the motor from 8 V (forward) to 24 V (reverse) to rotate the motor at a high speed when moving the scanner forward and in reverse.

The constant current control circuit controls the current so that the current flowing into the motor is appropriate to each rotation speed.

When the motor is at rest during standby mode, the current flowing into the motor is cut off by the HOLD-OFF signal, thereby preventing overheating of the motor.

D. Varying the Reproduction Ratio

The reproduction ratio in the main scanning direction (drum axial) is varied by skipping image signals written in the line memory (reduction) or repeating data read from the line memory (enlargement).

The reproduction ratio in the sub scanning direction is varied by moving the mirror mount faster (reduction) or slower (enlargement).

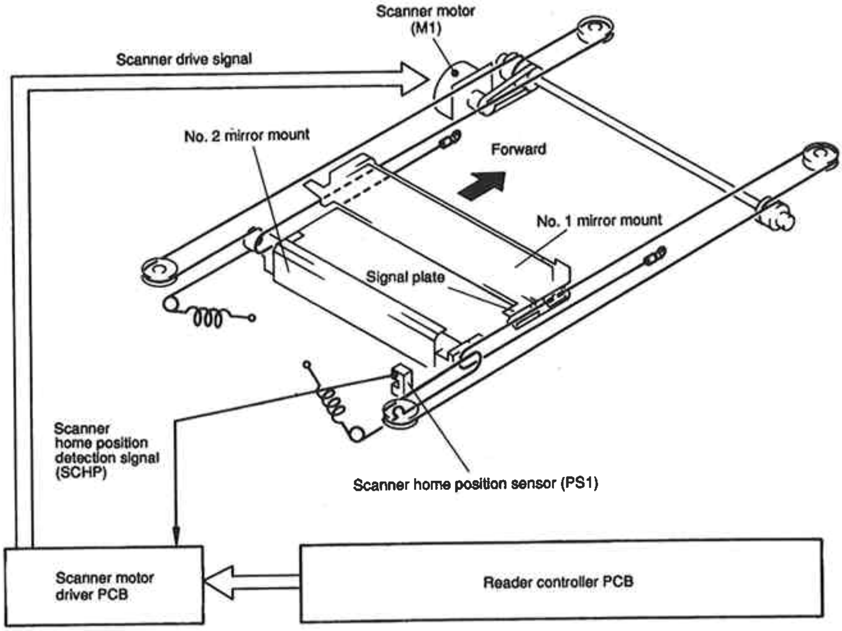

Scanner motor (M1)
Scanner drive signal
No. 2 mirror mount
Forward
No. 1 mirror mount
Signal plate
Scanner home position detection signal (SCHP)
Scanner home position sensor (PS1)
Scanner motor driver PCB
Reader controller PCB

Figure 3-207

E. Controlling the Scanning Lamp Intensity

1. Outline

Figure 3-208 shows the circuit used to control the scanning lamp intensity with the following functions:

1) Turns on and off the scanning lamp.
2) Checks if the scanning lamp is on or not.
3) Controls the scanning lamp intensity, i.e., keeping the intensity constant against fluctuations in the supply voltage.

2. Operation

a. Turning On and Off the Scanning Lamp

When LAON=0, the lamp regulator drive circuit turns off, causing the intensity control circuit to turn off and the scanning lamp (LA1) to turn off.

When LAON=1, the lamp regulator drive circuit turns on, causing the intensity control circuit to turn on and the scanning lamp (LA1) to turn on.

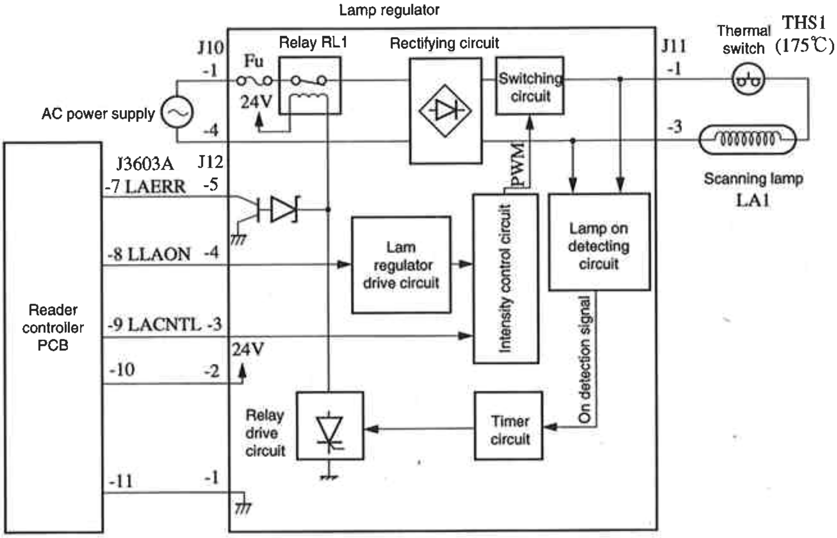

Lamp regulator
J10
-1
-4
Fu
24V
Relay RL1
Rectifying circuit
Switching circuit
J11
-1
-3
Thermal switch
THS1
(175℃)
Scanning lamp
LA1
AC power supply
Reader controller PCB
J3603A
J12
-7 LAERR -5
-8 LLAON -4
-9 LACNTL -3
-10 -2
-11 -1
24V
PWM
Lam regulator drive circuit
Intensity control circuit
Lamp on detecting circuit
On detection signal
Relay drive circuit
Timer circuit

Figure 3-208

b. Detecting the Activation of the Scanning Lamp

As long as the scanning lamp (LA1) is on, the lamp on detecting circuit remains on to send the on detection signal to the timer circuit.

If, for some error, the scanning lamp remains on for about 60 sec, the timer circuit activates the relay drive circuit to turn on the relay (RL1); the condition cuts off the AC input, thereby turning off the scanning lamp and, at the same time, sending the lamp error signal (LAERR) to the reader controller PCB. As a result, 'E220' is indicated on the control panel.

When the relay has been turned on, you may reset the copier by turning the power switch off and then on.

The copier is provided with the following two protection mechanisms to prevent the wrong activation of the scanning lamp:

- If the temperature inside the thermal switch exceeds 175°C, the thermal switch turns off to cut off the power to the scanning lamp.
- If an overcurrent flows because of a short circuit around the scanning lamp, the fuse turns off to cut off the supply power to the lamp regulator.

Caution:
The thermal switch (THS1) is used on a DC line, and its contact is subject to damage upon activation. Do not reuse the switch, or its activation after recovery may fail the mechanism.

c. Controlling the Scanning Lamp Intensity

The scanning lamp intensity is determined by the value of the intensity adjustment signal (LACNTL) sent by the reader controller PCB.

The intensity control circuit of the lamp regulator generates pulse signals (PWM) that suit the LACNTL signal to the switch circuit, and the switch circuit turns on and off at short intervals.

Varying the on/off intervals, the current supplied to the scanning lamp is controlled, thereby ultimately controlling the intensity.

The value of the LACNTL signal is determined when 'CCD' under 'FUNCTION' is executed in service mode; thereafter, the value remains the same. You must execute 'CCD' under 'FUNCTION' in service mode whenever you have replaced the scanning lamp or reader controller PCB.

III. IMAGE PROCESSING SYSTEM

A. Outline

The image processing system consists of the CCD, CCD driver PCB, analog processor PCB, and image processor PCB, and serves to convert optical images from the original exposure system into electrical signals, corrects and processes them, and sends them to the laser exposure system.

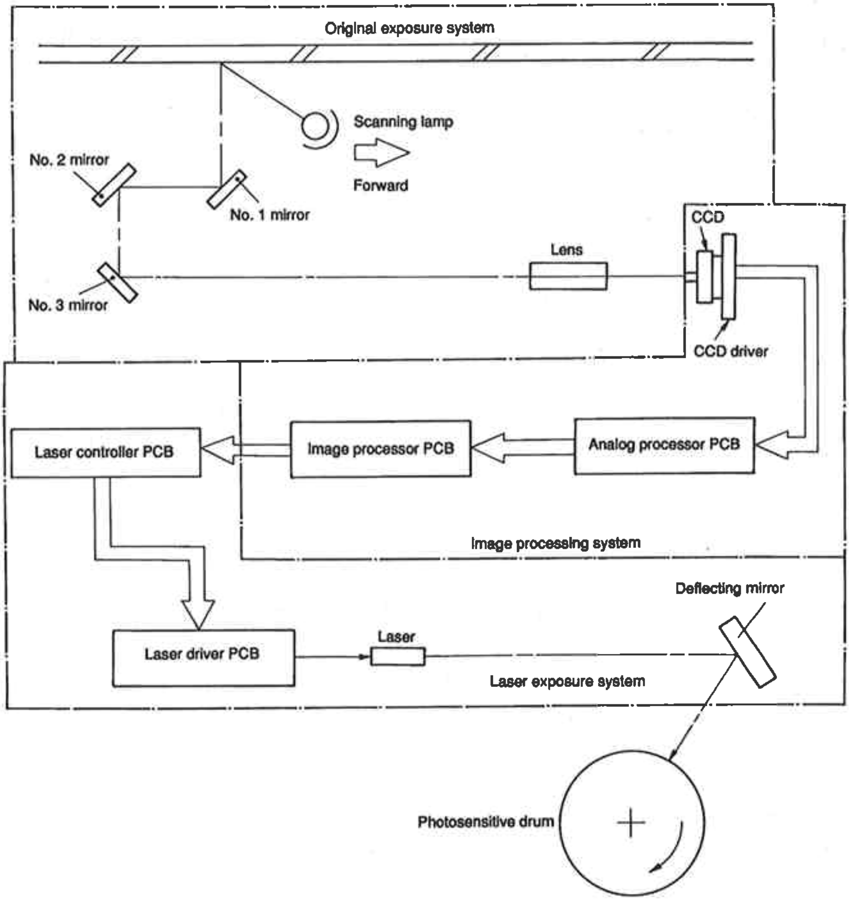

Original exposure system
Scanning lamp
Forward
No. 2 mirror
No. 1 mirror
Lens
CCD
No. 3 mirror
CCD driver
Laser controller PCB
Image processor PCB
Analog processor PCB
Image processing system
Deflecting mirror
Laser driver PCB
Laser
Laser exposure system
Photosensitive drum

Figure 3-301

B. CCD/CCD Driver

1. CCD

The CCD (charge-coupled device) used in the copier consists of three lines of about 5,000 photocells, and each CCD line is covered by a B, G, or R filter.

In addition, each CCD line consists of a transfer unit and output unit; the outputs from the odd-number light-receiving units and the even-number light-receiving units are generated by the output unit A and output unit B, respectively. In other words, the CCD lines used in the copier simultaneously generate six channels of image signals.

2. CCD Driver

The image signals generated by the CCD are sent through a buffer (lower impedance transforming circuit) to assume a low impedance and sent to the analog processor PCB.

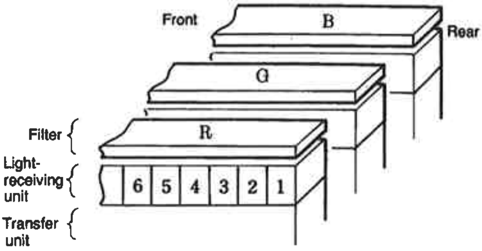

Front
B
Rear
G
R
Filter
Light-receiving unit
6
5
4
3
2
1
Transfer unit

Figure 3-302

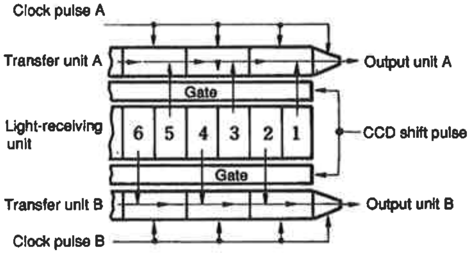

Clock pulse A
Transfer unit A
Output unit A
Gate
Light-receiving unit
6
5
4
3
2
1
CCD shift pulse
Gate
Transfer unit B
Output unit B
Clock pulse B

Figure 3-303

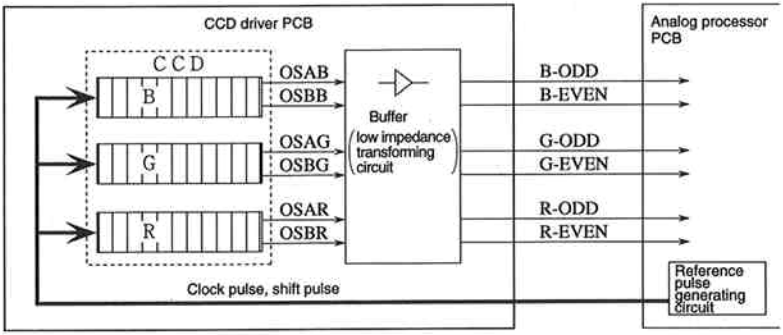

CCD driver PCB
CCD
B
G
R
OSAB
OSBB
OSAG
OSBG
OSAR
OSBR
Buffer
(low impedance transforming circuit)
B-ODD
B-EVEN
G-ODD
G-EVEN
R-ODD
R-EVEN
Analog processor PCB
Reference pulse generating circuit
Clock pulse, shift pulse

Figure 3-304

C. Analog Image Processing

The circuit processes the output of the CCD for the following:

- Odd/even bit synthesis
- BGR level matching
- A/D conversion

The six channels of image signals (odd/even bit, independent) is sample-held by the sample hold signal (SH), and synthesized into image signals of three channels (BGR) according to the select signal (SEL).

Then, BGR level-matching is executed according to the BGR gain signal and BGR offset signal for correction of the photoconversion efficiency of each CCD (B, G, R).

The A/D converting circuit operates in relation to the ADCLK signal, and converts the BGR image signals into digital signals (8 bits each) for the image processor PCB.

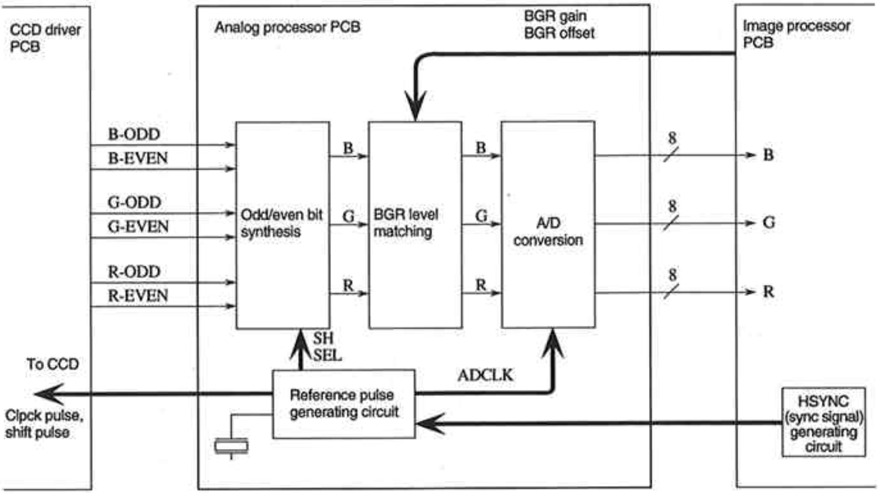

CCD driver PCB
Analog processor PCB
BGR gain
BGR offset
Image processor PCB
B-ODD
B-EVEN
G-ODD
G-EVEN
R-ODD
R-EVEN
Odd/even bit synthesis
B
G
R
BGR level matching
B
G
R
A/D conversion
8
8
8
B
G
R
SH
SEL
To CCD
Clpck pulse, shift pulse
Reference pulse generating circuit
ADCLK
HSYNC (sync signal) generating circuit

Figure 3-305

D. Digital Image Processing

1. Outline

The copier performs digital image processing using the PCBs shown in Table 3-301, which are collectively called the image processor.

The BGR image signals sent by the analog image processing system are converted into YMCBk image signals in the digital image processing system.

Each specific conversion of individual data items is also executed for the appropriate image processing specified on the control panel. The image data upon conversion will be 8-bit image signals ready for transmission to the printer unit.

PCB	Description	CLC700	CLC800
IP-MOTHER	Bus for the IP PCBs.	○	○
IP-MAIN IP-KM (TYPE1 only)	Shading correction, 3-line position matching, color correction, original size detection, color property compression, logarithmic correction, coloring, outline processing, density correction, reproduction ratio/slant processing, harness/filter processing, anti-counterfeit processing, black text generation/processing (black extraction, line width detection, edge detection)	○	○
IP-ECO	Assists IP-MAIN.	○	○
IP-ED	Interface between copier and external devices, editing based on input signals from editor (color conversion, texture processing)	☐	☐
IP-IF	Interface between copier and external devices	Δ	X
IP-PRJ	Projector auto focusing, shading correction, color correction, and mirror image processing when projector is in use	Δ	Δ

Table 3-301

- ○ comes as standard; Δ is available as an option; X is not accommodated; ☐ available as option for certain models.
- For the CLC700, either IP-IF PCB or IP-ED PCB may be installed as an option.

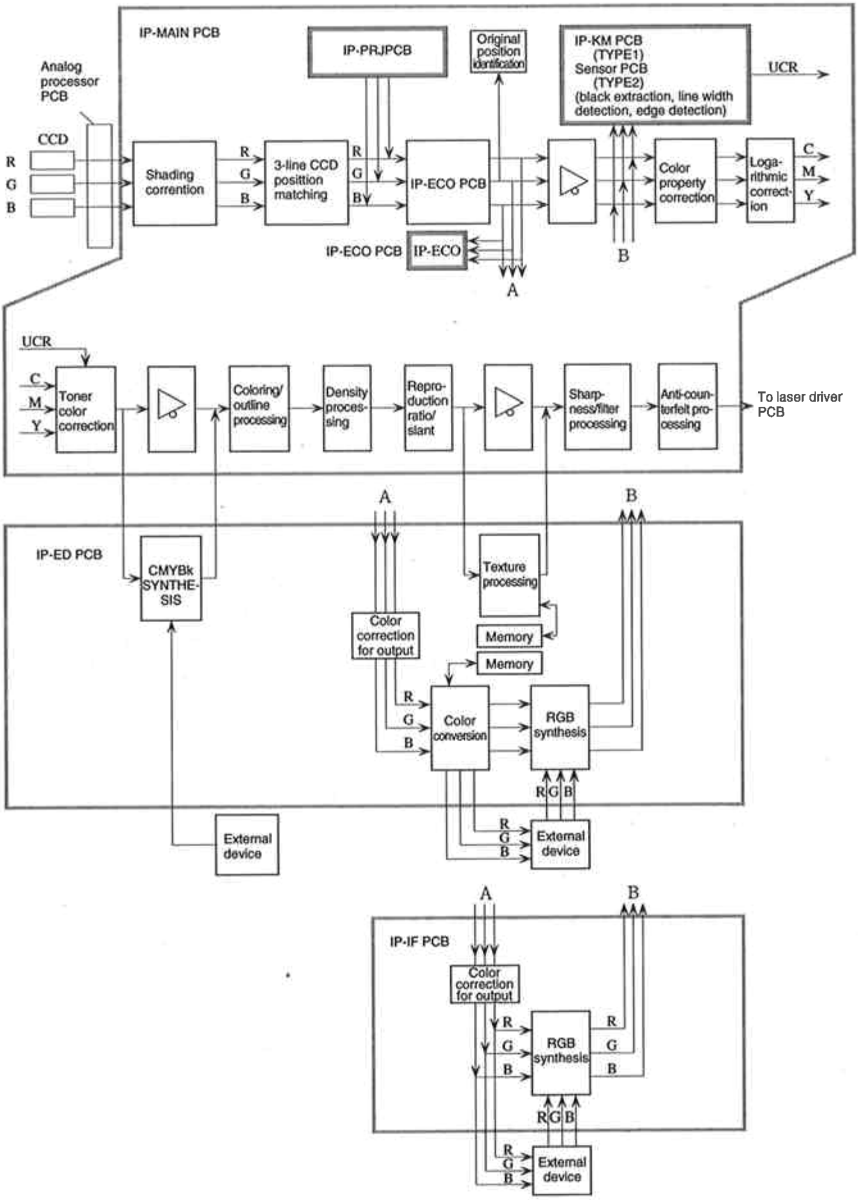

IP-MAIN PCB
Analog processor PCB
CCD
R
G
B
Shading corrention
R
G
B
3-line CCD posittion matching
IP-PRJPCB
R
G
B
IP-ECO PCB
IP-ECO PCB
IP-ECO
Original position identification
A
IP-KM PCB (TYPE1)
Sensor PCB (TYPE2)
(black extraction, line width detection, edge detection)
UCR
Color property correction
B
Loga-rithmic correct-ion
C
M
Y
UCR
C
M
Y
Toner color correction
Coloring/ outline processing
Density proces-sing
Repro-duction ratio/ slant
Sharp-ness/filter processing
Anti-coun-terfeit pro-cessing
To laser driver PCB
A
B
IP-ED PCB
CMYBk SYNTHE-SIS
Color correction for output
Texture processing
Memory
Memory
R
G
B
Color conversion
RGB synthesis
R G B
External device
R
G
B
External device
A
B
IP-IF PCB
Color correction for output
R
G
B
RGB synthesis
R
G
B
R G B
R
G
B
External device

Figure 3-306

2. Shading Correction

The output of the CCD will not necessarily be uniform even if light is reflected by an original whose density is uniform for the following factors:

- The CCD's pixels may have different sensitivities.
- The transmission characteristic of the lens differs between its center and the peripheral areas.
- The scanning lamp is subject to deterioration.

Shading correction is performed for the purpose of correcting these factors.

a. The CCD reads the bar code found beneath neath the standard white plate.

Reference 1

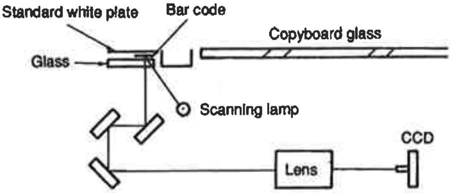

Standard white plate
Bar code
Copyboard glass
Glass
Scanning lamp
CCD
Lens

Figure 3-307

b. The CCD measures the intensity of the light reflected by the standard white plate, and generates data that represents the light.

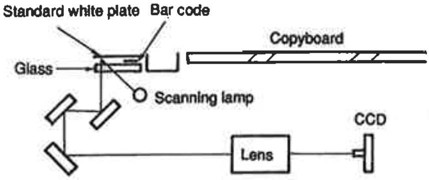

Standard white plate
Bar code
Copyboard
Glass
Scanning lamp
CCD
Lens

Figure 3-308

c. The shading correction circuit compares the measurement data of b. against the target value determined in a., and memorizes the difference as the shading correction value.

The shading correction value is used to correct data obtained during scans, and these measurements are taken each time the Copy Start key is pressed.

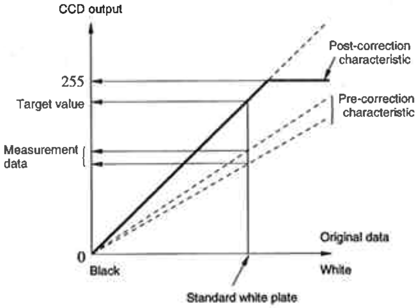


Figure 3-309

Reference:

1. A bar code is attached to the copier's standard white plate to represent the light (B, G, R) reflected by each standard white plate; measurements are taken at the factory and converted into bar code notation.
2. The color balance for light areas may be adjusted by 'OFST' under 'COL-ADJ'.
3. If the density or color balance cannot be adjusted by the base film when making copies of negative film, it is a good idea to adjust 'NEGA' under 'SH-TRGT'.
4. Scratches or dirt on the standard white plate increases shading correction for the corresponding areas, causing vertical white lines on copies.
   If lines persist after cleaning the standard white plate, you may change the position of shading correction by 'ADJ-S' under 'ADJ-XY' in service mode.

3. 3-Line CCD Position Matching

The copier's CCD is really three CCDs each covered by any of the R, G, and B filters, and the line image generated by each CCD at a specific point has a discrepancy of about 0.5 mm (for 8 lines) in relation to the copyboard glass.

This discrepancy is corrected by storing the R and G image signals temporarily in the line memory and generating them after synchronizing them with the B image signal.

Reference:

The delay in the B image signal is at its maximum when 400% enlargement is made; at this time, the R image signal is delayed for 64 lines, and the G image signal is delayed for 32 lines.

For example, when 320% enlargement is made, the R image signal must be delayed for 51.2 lines; here, the following correction is made using data representing adjacent pixels:

image data representing the 51.2 line = 0.8 x (pixel data representing the 51st line) + 0.2 x (pixel data representing the 52nd line).

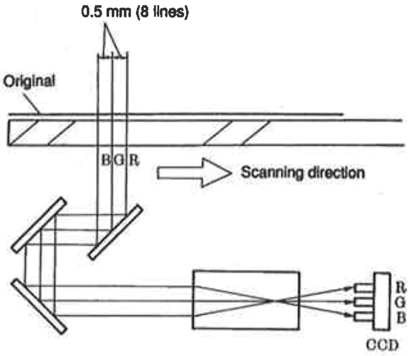


Figure 3-310

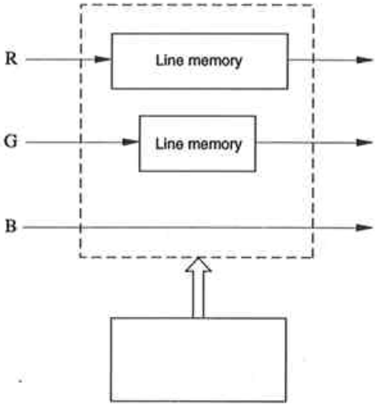


Figure 3-311

4. Sensor Color Correction Block

The sensor color correction block refers to the circuit that corrects the transmission characteristic of the B, G, and R filter of the CCD.

Each filter would be ideal if it transmitted light of a specific wavelength and reflected light of other wave lengths; since this is not the case and the filters transmit unwanted light as well, a special circuit is needed for correction.

For instance, a G filter would be ideal if it let pass 100% of light of 500 nm to 600 nm in length (green) and blocked light 500 nm or less and 600 nm or more in length.

In reality, light of a length indicated as *a* and *c* of Figure 3-312 passes through the filter while light of a length represented by *b* is blocked.

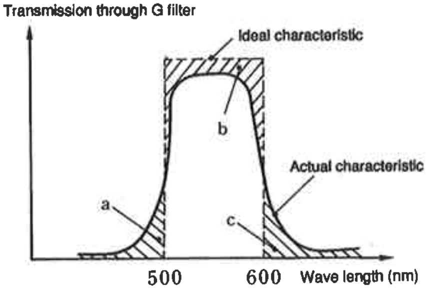


Figure 3-312

To correct the actual characteristic so that it is made as close to the ideal characteristic as possible, the following computations are made:

$$\begin{pmatrix} \text{Rout} \\ \text{Gout} \\ \text{Bout} \end{pmatrix} = \begin{pmatrix} a_{11} \\ a_{21} \\ a_{31} \end{pmatrix} \begin{pmatrix} a_{12} \\ a_{22} \\ a_{32} \end{pmatrix} \begin{pmatrix} a_{13} \\ a_{23} \\ a_{33} \end{pmatrix} \begin{pmatrix} R \\ G \\ B \end{pmatrix}$$

- RGB : input signal to color correction circuit.
- Rout, Gout, Bout : output signals from color correction circuit
- a11 through a33 : correction coefficient

5. Original Position Identification

The term original position identification refers to finding out the location and size of the original on the copyboard.

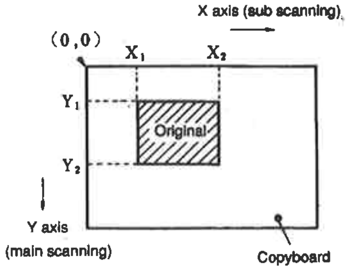


Figure 3-313

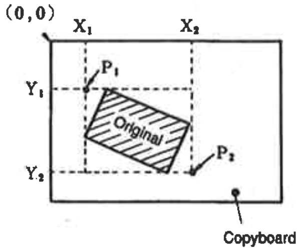


Figure 3-314

Figure 3-313 shows when a rectangular original is placed on the copyboard in relation to the X (sub scanning) and Y (main scanning) axis of the copyboard; Figure 3-314 shows when an original is placed at a slant.

The bottom of the copyboard cover is mirror-finished, i.e., unlike the copyboard cover of a conventional copier, it is not white or does not refract light; this way, the area covered by an original will reflect the light of the scanning lamp to the CCD.

- Area Covered by an Original

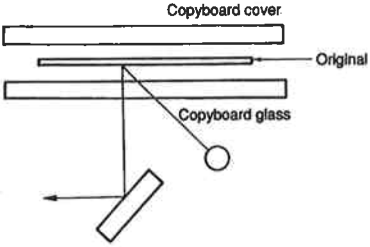


Figure 3-315

- Area Not Covered by an Original

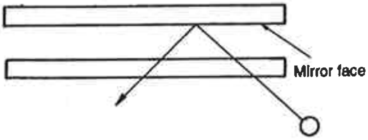


Figure 3-316

Most paper used as originals tends to be white so that the white area as detected during a scan may be identified as representing the area of the original.

In other words, a rectangle formed with a diagonal line running between coordinates Xmin/Ymin and Xmax/Ymax may be assumed to represent the original.

Placement of an original as shown in Figure 3-314, for this reason, will result in the copier's identifying the original as being of a size formed by P1 and P2.

Reference:

1. Xmin: .... stores the coordinates representing the change from first black to white.
2. Xmax: ... stores the coordinates representing the change from the last white to black.
3. Ymin: .... stores the coordinates closest to the point where the main scan started, while noting a change from black to white.
4. Ymax: ... stores the coordinates farthest from the point where the main scan started noting a change from white to black.

By automatically identifying the position and size of an original this way, automatic selection of a reproduction ratio or paper and image shifting become possible.

Caution:
Document position identification is not possible if an original is placed on the copyboard glass with an RF installed.

6. Black Extraction and Edge/Line Width Extraction

a. Outline

The copier's digital image processing block includes the IP-KM PCB, and performs the following image processing based on the BGR signals from the IP-MAIN PCB:

- black extraction
- edge extraction
- line width extraction

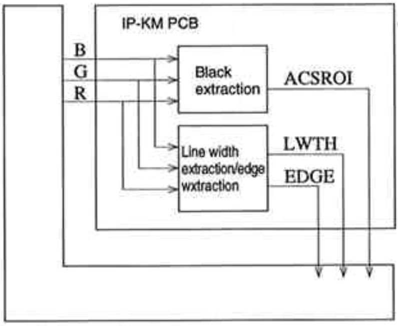


Figure 3-317

The black detection signal (ACSROI) generated by the IP-KM PCB helps the IP-MAIN PCB to generate the UCR signal. In addition, the IP-MAIN PCB uses three signals (ACSROI, EDGE, LWTH) to perform black text identification, sharpness processing level identification, laser line number switching (200/400 lines), and black original detection (ACS).

b. Black Extraction

Based on the BGR signal from the IP-MAIN PCB, the copier determines the pixel input representing either black or a color, and sends the result to the IP-MAIN PCB.

- BGR Input Identified as Black

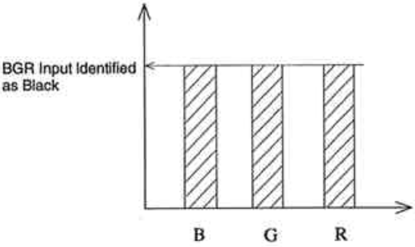


Figure 3-318

- BGR Input Identified as a Color

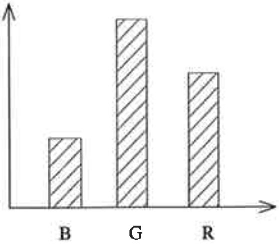


Figure 3-319

c. Edge Detection/Line Width Detection

In the edge detection/line width detection block, the BGR signal from the IP-MAIN PCB is used to generate the intensity signal representing each pixel; the intensity signals of multiple pixels surrounding the pixel in question are compared against this intensity signal.The changing number of pixels selected from among the adjacent pixels is used to determine whether the pixel in question is part of the edge of the input image; if so, the line width of the edge is also identified. When an edge is identified, the edge signal (EDGE) and line width signal (LWTH) are sent to the IP-MAIN PCB.

Reference:

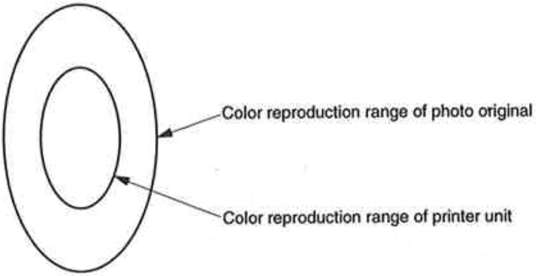
The black original detection signal (ACS) is generated based on the black detection signal (ACSROI) that is generated during pre-scanning.

7. Color Property Correction

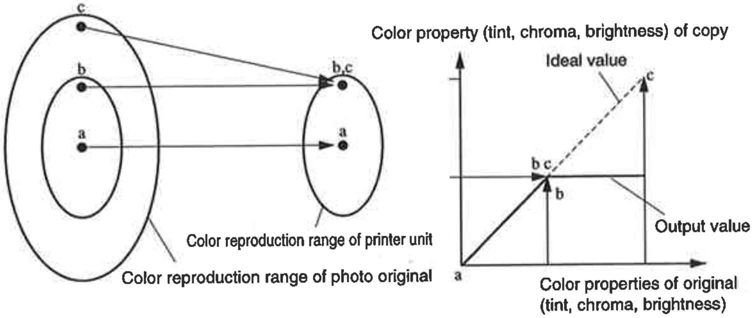
The range of color reproduction of the images generated by a photo original or computer is often greater than the printer unit's ability to reproduce color.

As shown in Figure 3-320, the conventional method enables the reproduction of original colors (points a and b) that are within the printer unit's color reproduction ability; however, since data representing a color (point c) outside the printer unit's color reproduction ability is not reproduced faithfully, there are bound to be discrepancies between the original and output images in terms of gradation.

The copier is designed so that it is aware of its printer unit's ability to reproduce color properties (tint, brightness, chroma). By determining the color properties of the original based on the RGB data it reads during pre-scanning, it converts the data to ensure that the data will be processed by its printer unit in such a way that it reproduces the colors as close to those of the original, reproducing the gradation of the original better than conventional copiers.


Color reproduction range of photo original
Color reproduction range of printer unit

- Conventional Method


c
b
a
b,c
a
Color reproduction range of printer unit
Color reproduction range of photo original
Color property (tint, chroma, brightness) of copy
Ideal value
c
b c
b
Output value
a
Color properties of original
(tint, chroma, brightness)

- CLC700/800

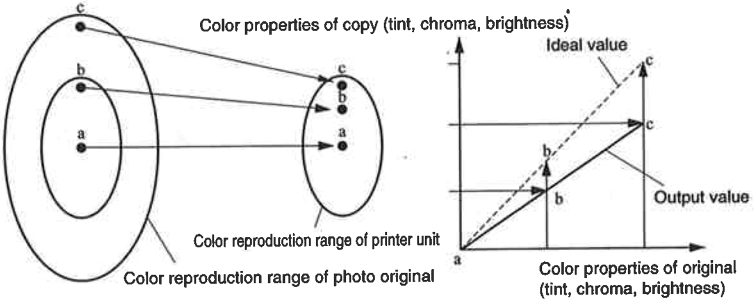

c
b
a
c
b
a
Color reproduction range of printer unit
Color reproduction range of photo original
Color properties of copy (tint, chroma, brightness)
Ideal value
c
c
b
b
Output value
a
Color properties of original
(tint, chroma, brightness)

Figure 3-320

8. Logarithmic Correction and BGR-to-YMC Conversion

a. Logarithmic Conversion

The output from the CCD has a linear characteristic in relation to the intensity of light reflected by an original; however, the density of an original as perceived by the eye is not linear.

Figure 3-321 shows the relationship between the density of an original as perceived by the eye and the output of the CCD.

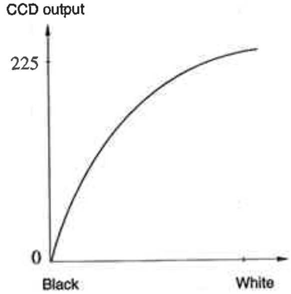


Figure 3-321

To correct the discrepancy, level conversion is performed; see Figure 3-322.

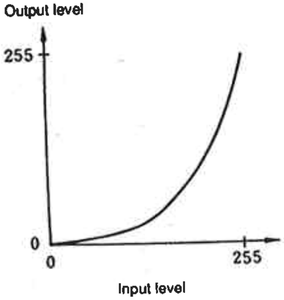


Figure 3-322

b. BGR-to-YMC Conversion

The circuit generates YMC signals taking advantage of the complementary relationship between the BGR lights and YMC toners.

Toner Light	Y	M	C
B	Absorption	Reflection	Reflection
G	Reflection	Absorption	Reflection
R	Reflection	Reflection	Absorption

Table 3-302

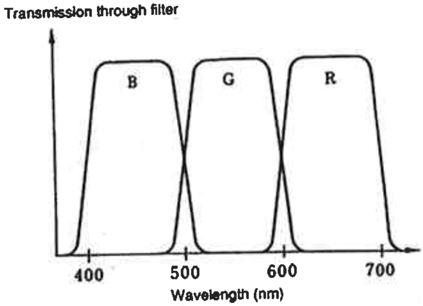


Figure 3-323

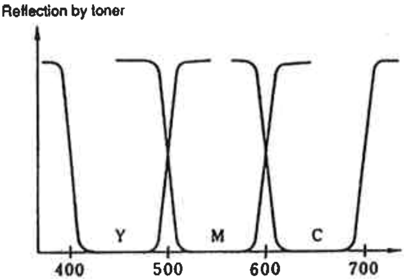


Figure 3-324

The transmission through each of the CCD filters (B, G, R) and the density of the original (Y, M, C) are complementary; level conversion is performed as in Figure 3-325 to generate each of the Y, M, and C signals.

BGR-to-YMC Conversion

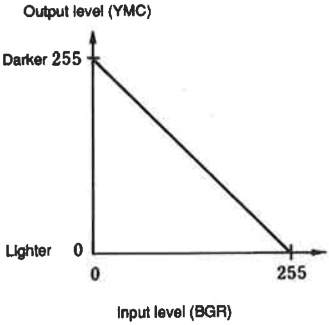


Figure 3-325

Reference:

Y=B, M=G, C=R

9. Toner Color Correction

The toner color correction block generates the Bk signal using the UCR signal from L-KM PCB and, at the same time, corrects the reflection characteristic of each toner for the printer unit.

For instance, the M toner ideally should absorb 100% of light which is 500 nm to 600 nm in wave length (green) and reflects all light with light wave lengths of 500 nm or less and 600 nm or more; in reality, however, areas represented by a, b, and c in Figure 2-326 exist.

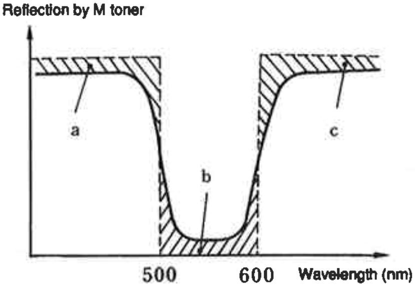


Figure 2-326

Color correction is performed to compensate for such a discrepancy.

10. Coloring/Outline Processing

The coloring/outline processing block processes/modifies image data according to the color and are specified on the control panel or by the editor. A specified area is divided into a text area and background (without image data); a text area, further, is divided into a text area, character outline area, and shade area, all of which are generated by the IP-ED PCB. Each of these areas are then subjected to image data processing/modification.

- Painting
  The specified area is painted with a speci fied color.
- User Coloring
  The image data for the specified area is converted to represent a specified color.
- Gradation
  Within the specified area, the ratio of two specified colors is varied for painting.
- Color Filtering
  Within the specified area, a fixed synthesis ratio is used to synthesize the colors represented by image data and specified colors.

11. Density Processing

The correction curve for the density processing is varied according to the settings of the following:

a. Copy Density key on the control panel
b. Color balance on the control panel
c. Color balance in service mode (COL-ADJ)
d. Light area offset adjustment in service mode (OFST of COL-ADJ)
e. Text/photo mode

According to items from a to d above, a darker or lighter curve is used as shown in Figure 3-327.

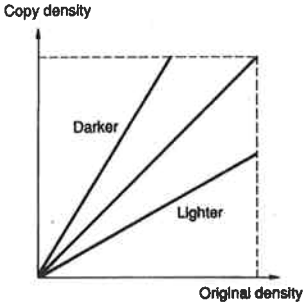


Figure 3-327

If in text mode (item e), a curve which ensures dark text without fogging will be used as in Figure 3-328.

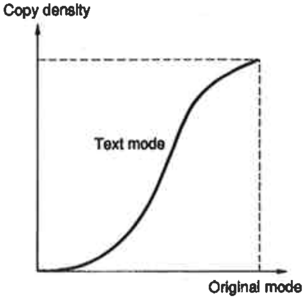


Figure 3-328

12. Reproduction Ratio/Shift/Editing Processing

a. Reproduction Ratio

① Horizontal Ratio (main scanning direction)

When writing image data to memory, data is skipped (reduction); when reading from memory, the same data may be read repeatedly (enlargement).

② Vertical Ratio (sub scanning direction)

The speed at which the scanner moves is varied, thereby changing the scanning width for a single pixel on the original.

Table 3-303 shows how the copier processes reproduction ratios.

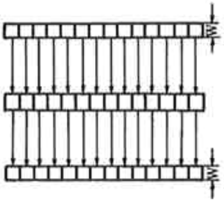
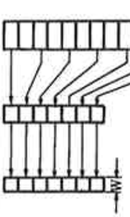
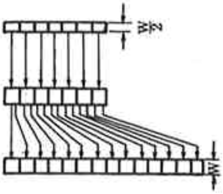
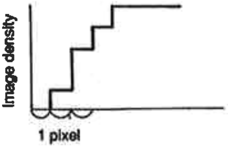
	DIRECT	REDUCE	ENLARGE
Original (image data) Line memory (reading) Copy			
Reproduction ratio in main scanning direction	All data is written in memory as it is and read as it is.	To reduce by 50%, every other data unit is written.	To enlarge by 200%, all data is written in memory as it is, but the same data is read twice.
Reproduction ratio in sub scanning direction		The scanner is moved faster to increase the scanning width for a pixel on the original.	The scanner is moved slower to decrease the scanning width of a pixel on the original.

Table 3-303

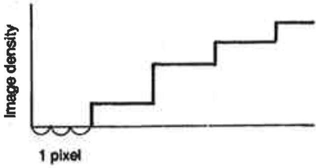
b. Enlargement Correction

When enlargement is used, the image data is corrected so that the difference in density between pixels will not vary exceedingly.

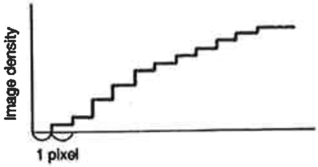
Figure 3-329 shows image data representing an original, image data at time of enlargement, and image data after enlargement correction.



a. Original



b. 300% Enlargement

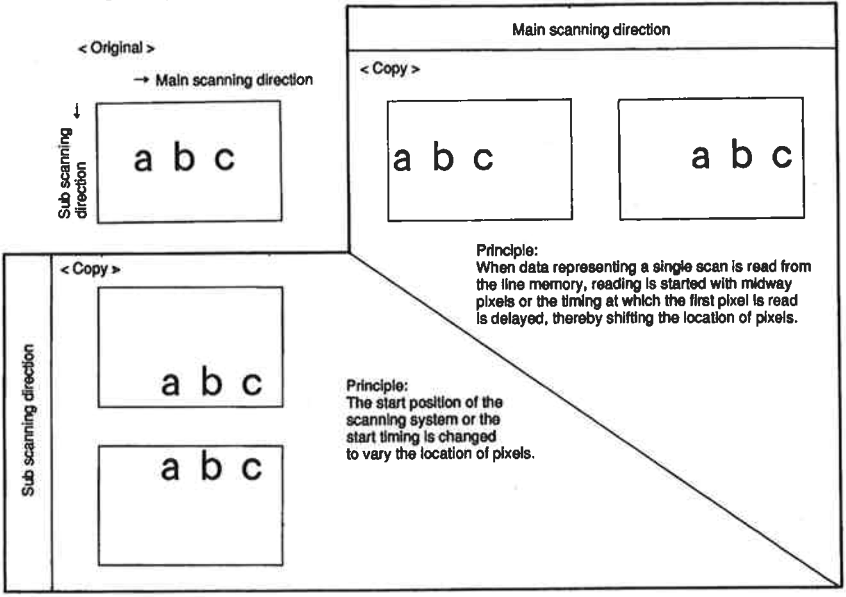


c. After Enlargement Correction

Figure 3-329

c. Shift

Figures 3-330, -331, and -332 give an outline of the shift mechanism in both main and sub scanning directions using examples.


< Original >
Main scanning direction
Sub scanning direction
a b c
Main scanning direction
< Copy >
a b c
a b c
< Copy >
Sub scanning direction
a b c
a b c

Principle:
When data representing a single scan is read from the line memory, reading is started with midway pixels or the timing at which the first pixel is read is delayed, thereby shifting the location of pixels.

Principle:
The start position of the scanning system or the start timing is changed to vary the location of pixels.

Figure 3-330

Supplementary Information
(shift in main scanning direction)

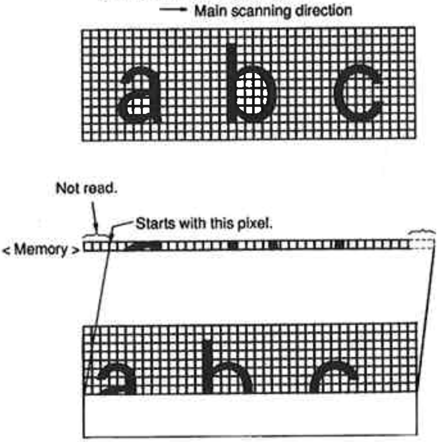

Main scanning direction
a b c
Not read.
Starts with this pixel.
< Memory >

Figure 3-331

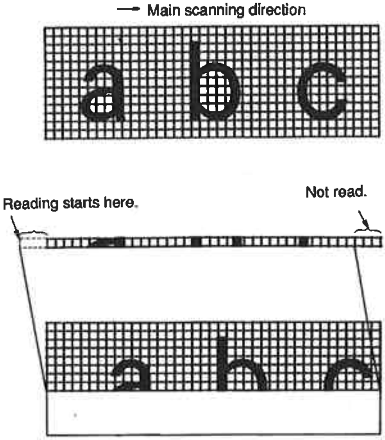

Main scanning direction
a b c
Reading starts here.
Not read.

Figure 3-332

Combining shifts in the main and sub scanning directions, the following shifts will be possible:

① Center Shift
From the size of the area to be shifted and the size of the copy paper used, coordinates (Xm, Ym) of a rectangle whose top/bottom and left/margins on the copy will be identical are computed, and the area is shifted to the point.

② Left/Right Binding
The entire image is shifted to provide a binding margin.

③ Specified Shift
An area is shifted for a specified distance.

Reference:

$$Xm= \frac{Xmax- (X_2-X_1)}{2},$$

$$Ym= \frac{Ymax- (Y_2-Y_1)}{2}$$

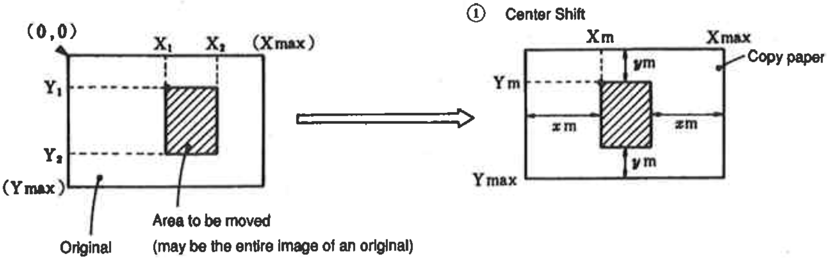

(0,0)
X₁
X₂
(Xmax)
Y₁
Y₂
(Ymax)
Original
Area to be moved
(may be the entire image of an original)
① Center Shift
Xm
Xmax
Copy paper
Ym
ym
xm
xm
ym
Ymax

Figure 3-333 Center Shift

d. Mirror Image

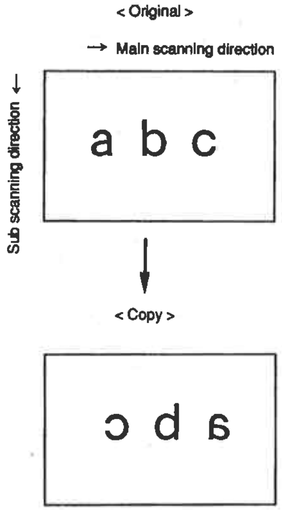

< Original >
→ Main scanning direction
Sub scanning direction ↓
a b c
< Copy >
ɔ d ɒ

Figure 3-334

Principle

When data representing a single scan is read from RAM, reading is executed in reversed order, thereby creating a mirror image in relation to the main scanning direction.

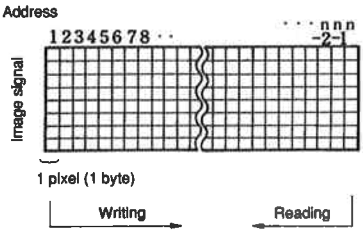

Address
12345678 · ·
· · · n n n
-2-1
Image signal
1 pixel (1 byte)
Writing
Reading

Figure 3-335

e. Image Repeat

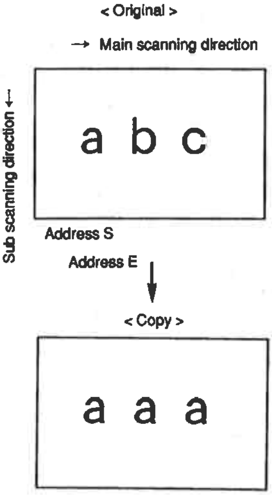

< Original >
→ Main scanning direction
Sub scanning direction ↓
a b c
Address S
Address E
< Copy >
a a a

Figure 3-336

Principle

When reading data representing a single line is read from RAM, the starting address (address S) and the ending address (address E) are specified; then, reading is started with address S and, when address E is reached, reading is resumed starting with address S once again. An image may be duplicated by repeating this operation.

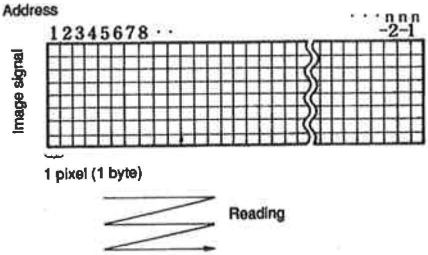

Address
12345678 · ·
· · · n n n
-2-1
Image signal
1 pixel (1 byte)
Reading

Figure 3-337

13. Sharpness/Filter Processing

In this processing, computations are made to create sharp or soft images according to the settings of the selected copy mode or in sharpness mode.

Figure 3-339 shows the output level of image data whose input is shown in Figure 3-338 with 'Sharpness Weak' selected.

In 'Sharpness Weak', the changes in the density of the image are smoothed out to produce a soft image.

Figure 3-340 shows the output level when 'Sharpness Strong' is selected.

In 'Sharpness Strong', the changes in the density of the image is emphasized to produce a sharp image.

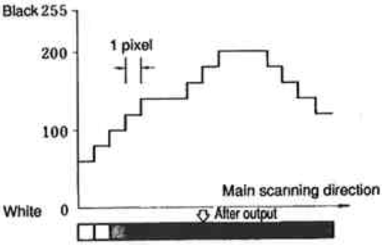


Figure 3-338 Input Level

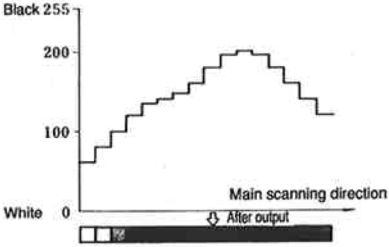


Figure 3-339 Sharpness Weak

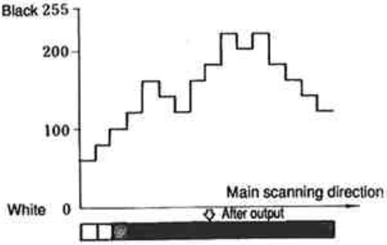


Figure 3-340 Sharpness Strong

14. CMYBk/RGB Synthesis

The CMYBk synthesis block and RGB synthesis block perform the following processing according to instructions from the control panel and editor:

- Transparent synthesis
- Gradation processing

CMBk or RGB image data from an external device (IPU) and CMYBk or RGB image data are synthesized based on the ratio specified by the control panel or editor.

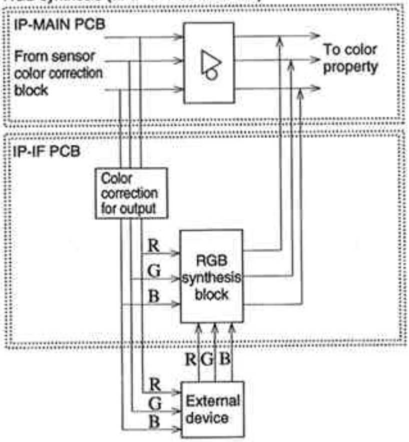

RGB synthesis (w/ IP-IF PCB installed)
IP-MAIN PCB
From sensor color correction block
To color property
IP-IF PCB
Color correction for output
R
G
B
RGB synthesis block
R G B
R
G
B
External device

Figure 3-342

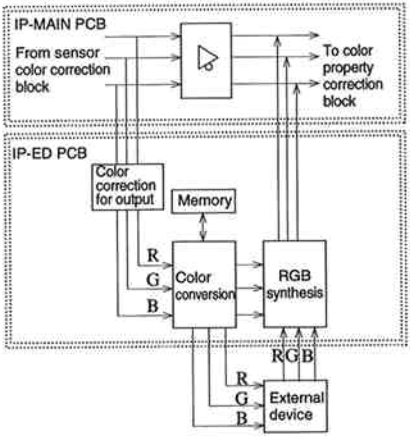

RGB synthesis (w/ IP-ED PCB installed)
IP-MAIN PCB
From sensor color correction block
To color property correction block
IP-ED PCB
Color correction for output
Memory
R
G
B
Color conversion
RGB synthesis
R G B
R
G
B
External device

Figure 3-341

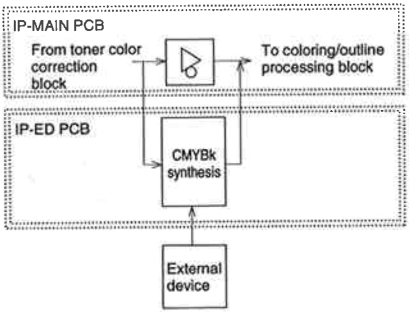

CMYBk synthesis
IP-MAIN PCB
From toner color correction block
To coloring/outline processing block
IP-ED PCB
CMYBk synthesis
External device

Figure 3-343

15. Texture Processing

Image data read during pre-scanning is stored according to the instructions from the control panel and is read during original image processing.

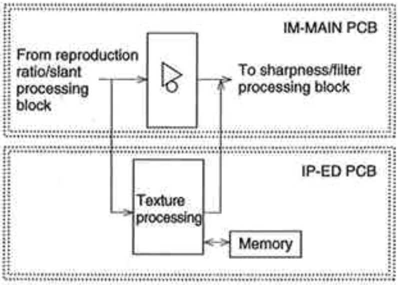

IM-MAIN PCB
From reproduction ratio/slant processing block
To sharpness/filter processing block
IP-ED PCB
Texture processing
Memory

Figure 3-344

16. Color Conversion

The color conversion block performs the following processing according to instructions sent from the control panel or editor:

- Color conversion
- Posterization
- Solarization

In the color conversion block, the RGB data that has been read is converted to color property data (tint, chroma, brightness), which will then be processed for the above; thereafter, the color property data is further converted to RGB data for transmission to the next step.

When sending images read from the scanner unit to an external device, image data is sent out by the color conversion block.

IV. LASER EXPOSURE SYSTEM

A. Outline of the Laser Exposure System

The laser exposure system consists of a laser unit, which is the source of laser beams, and a laser scanner which is equipped with an 8-facet mirror used to scan the photosensitive drum with a laser beam.

The video signals (VDO-0 through -7) from the image processor PCB are converted into laser intensity signals (LD) on the laser driver PCB, and the semiconductor laser inside the laser unit generates a laser beam according to these laser intensity signals.

The laser beam is then turned into a parallel beam having an oval cross section by a collimator lens; thereafter, it is corrected to assume a band shape by means of a cylindrical lens.

The laser beam is reflected by the 8-facet mirror rotating at a specific high speed, and directed to the photosensitive drum through imaging lenses.

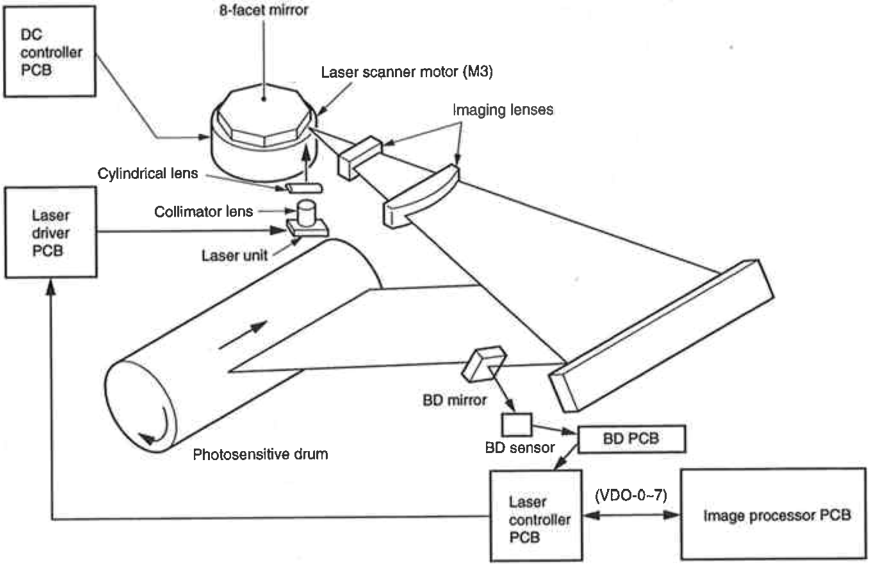

DC controller PCB
8-facet mirror
Laser scanner motor (M3)
Imaging lenses
Cylindrical lens
Laser driver PCB
Collimator lens
Laser unit
BD mirror
BD sensor
BD PCB
Photosensitive drum
Laser controller PCB
(VDO-0~7)
Image processor PCB

Figure 3-401

B. Timing Chart for the Laser Exposure System

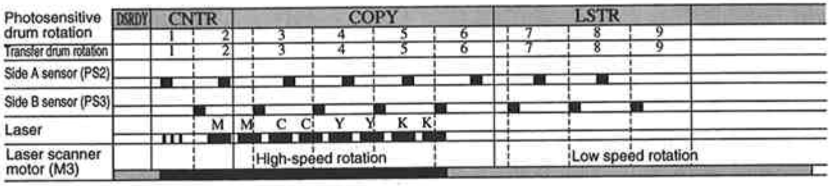


Figure 3-402 A4/LTR, 2 copies, 4-color, DIRECT, cassette 1

C. BD Signal Synthesis

The BD signal used to synchronize the video signals for the main scanning direction is generated in the beam detection signal generator circuit based on the laser beam reflected by the BD mirror found in the optical path of the laser beam.

Using the BD signal, the image processor PCB reads image signals from the CCD, performs image processing, and sends digital video signals to the laser controller PCB.

The digital video signals are converted into analog video signals on the laser controller PCB, and the laser driver PCB generates laser intensity control signals in sequence to represent these analog video signals.

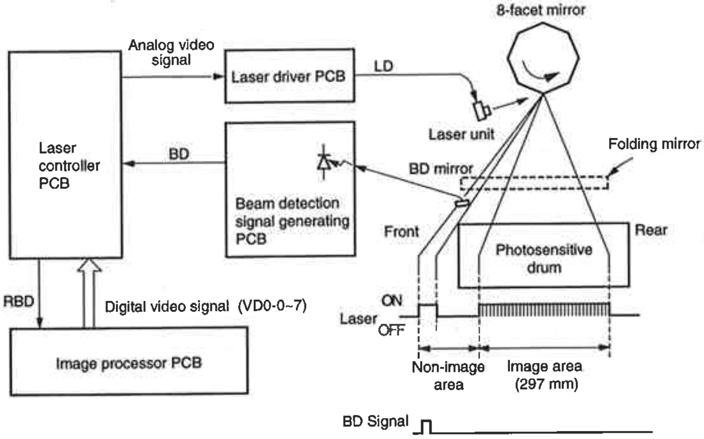

8-facet mirror
Analog video signal
Laser driver PCB
LD
Laser unit
Folding mirror
Laser controller PCB
BD
BD mirror
Beam detection signal generating PCB
Front
Rear
Photosensitive drum
RBD
Digital video signal (VD0-0~7)
ON
Laser
OFF
Image processor PCB
Non-image area
Image area (297 mm)
BD Signal

Figure 3-403

D. Laser Driver Circuit

Figure 3-404 shows the circuit that generates the laser intensity control signals based on the video signals (VDO-0 through VDO-7) from the image processor PCB to drive the semiconductor laser.

Using the 8-bit video signals, clock signals (VCLK), and sync signals (PVE) from the image processor PCB and the image leading edge signal (ITOP) from the DC controller PCB, the laser controller PCB generates the laser drive signal (L-OUT) for transmission to the laser driver circuit.

In addition, the switch signal (PH/TX) is selected by switching between text and photo to suit the selected copy mode for the main scanning direction (400 dpi for sub scanning direction).

When a test pattem is generated in service mode, the DC controller PCB sends an output command to the laser controller, where the test pattern is generated for output.

The laser controller PCB sends the auto output control signal (APCHLD) to the constant current circuit of the laser driver PCB to ensure stable laser output.

For making adjustments using VR951 through VR956, see the Service Handbook.

Reference:

L-ON (laser force on signal):
goes '1' (laser on) during laser power adjustment or when printing a test print of horizontal bands.
L-OFF (laser force off signal):
goes '1' when the front door is open (laser off).

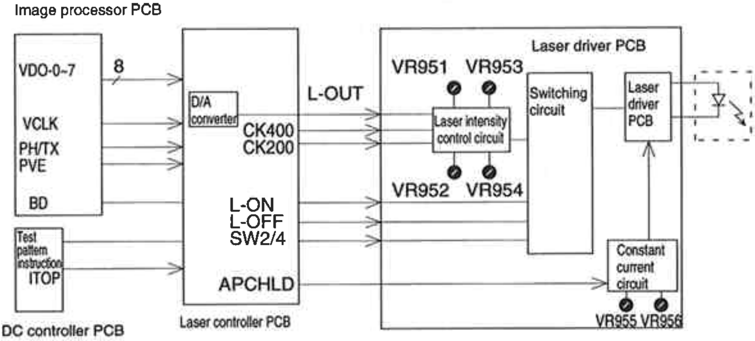


Image processor PCB
VDO-0~7
8
VCLK
PH/TX
PVE
BD
Test pattern instruction
ITOP
DC controller PCB
D/A converter
CK400
CK200
L-OUT
L-ON
L-OFF
SW2/4
APCHLD
Laser controller PCB
Laser driver PCB
VR951
VR953
Laser intensity control circuit
VR952
VR954
Switching circuit
Laser driver PCB
Constant current circuit
VR955
VR956

Figure 3-404

F. Laser Scanner Motor

The laser scanner motor (M3) is a brushless DC motor with a built-in rotation speed control circuit. When the DC controller PCB causes the laser scanner motor drive signal (M3ON*) to go '0', the motor rotates at a specific speed.

During standby, the idle operation signal (M3IDL) is caused to go '0' to initiate low-speed operation.

If the rotation speed of the motor deviates for some error, the laser scanner motor ready signal (M3RDY*) goes '1' and the DC controller PCB indicates 'E110' on the control panel.

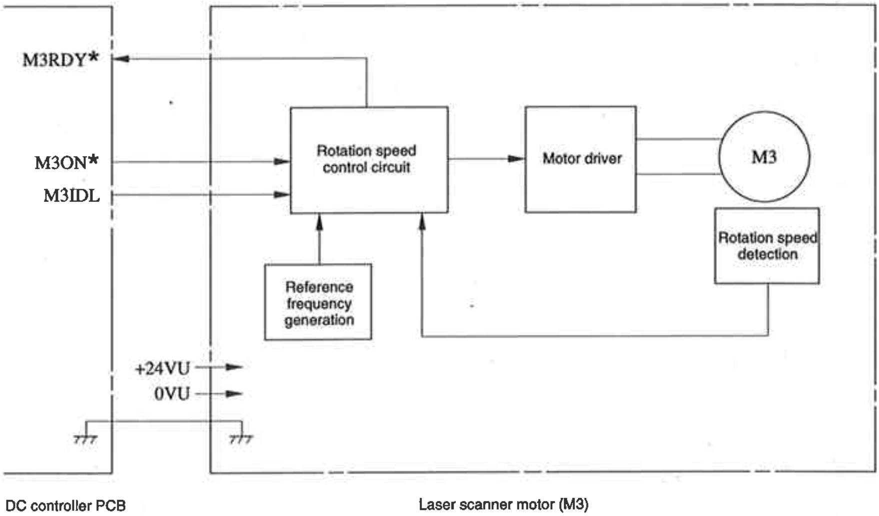

M3RDY*
M3ON*
M3IDL
Rotation speed control circuit
Motor driver
M3
Rotation speed detection
Reference frequency generation
+24VU
0VU
DC controller PCB
Laser scanner motor (M3)

Figure 3-405

V. IMAGE FORMATION SYSTEM

A. Outline

The functional construction of the copier's image formation system is as follows:

- Drum surface potential control
  Primary corona assembly grid bias control
  Developing bias control
- Drum toner density control
  Target contrast potential setting
  Gradation correction
- Primary corona ON/OFF
- Attraction brush current control
- Transfer brush current control
- Separation corona current control
- Internal static eliminator corona ON/OFF
- External static eliminator corona ON/OFF
- Photosensitive drum temperature control
- Primary corona wire cleaning control
- Developing assembly/photosensitive cleaning assembly
  Developing assembly engagement
  Color toner density detection
  Black toner density detection
  Drum toner density measurement
  Toner supply
  Photosensitive drum cleaning

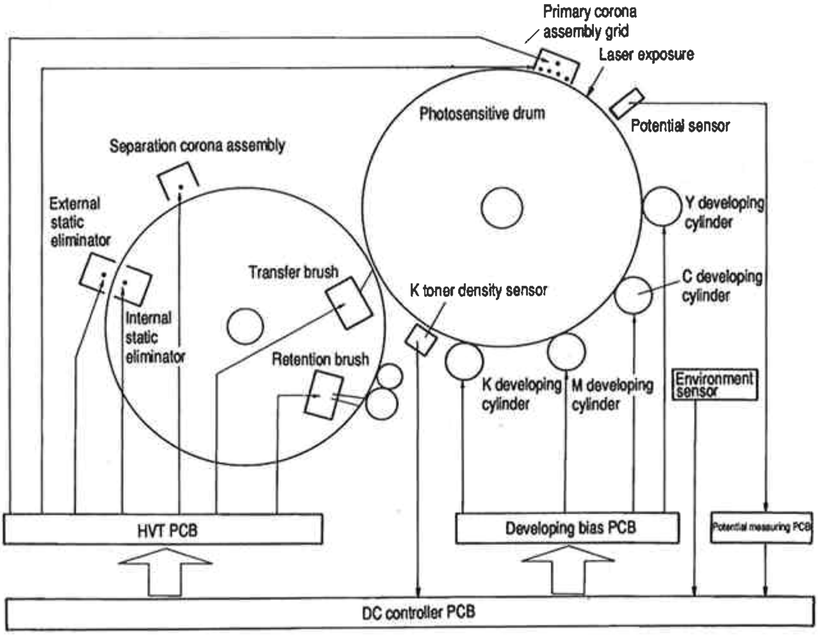

Primary corona assembly grid
Laser exposure
Photosensitive drum
Potential sensor
Separation corona assembly
External static eliminator
Transfer brush
K toner density sensor
Y developing cylinder
C developing cylinder
Internal static eliminator
Retention brush
K developing cylinder
M developing cylinder
Environment sensor
HVT PCB
Developing bias PCB
Potential measuring PCB
DC controller PCB

Figure 3-501

B. Timing Chart for the Image Formation System

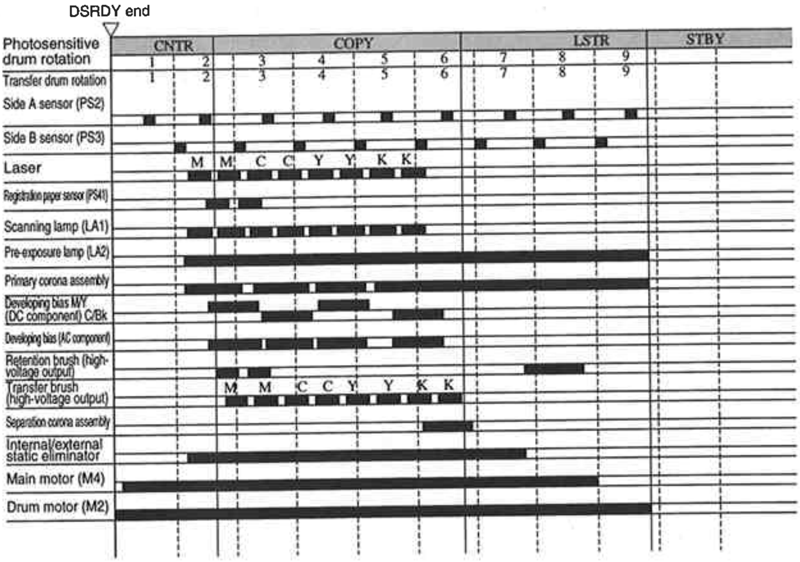


Figure 3-502 A4/LTR, 2 copies, 4-color, DIRECT, cassette 1

C. Image Stability Control

1. Outline

Copy images are subject to changes in the latent static images and development characteristics. Changes in the latent static images are often caused by

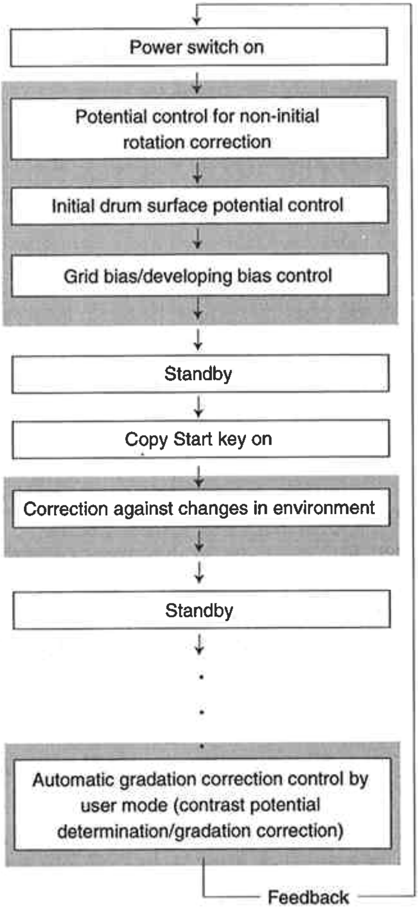
- deterioration in the sensitivity of the photosensitive drum, and
- changes in the discharge from the primary corona assembly.

Changes in the development characteristics, on the other hand, are often caused by

- changes in the toner/developer characteristics triggered by the site environment (temperature, humidity).

To ensure as much stability in the quality of the images in the presence of these factors, the copier is designed to control the grid bias of the primary corona assembly, developing bias, and laser output based on the input signals from the potential sensor and Bk toner density sensor read at time of power-on. In addition, while the copier remains on, the input signals from the environment sensor are used to correct the grid bias of the primary corona assembly and developing bias. In addition, the copier is equipped with an automatic gradation control mechanism that can be accessed in user mode.

See the flow below for an idea of the image stability control mechanism.


Power switch on
Potential control for non-initial rotation correction
Initial drum surface potential control
Grid bias/developing bias control
Standby
Copy Start key on
Correction against changes in environment
Standby
Automatic gradation correction control by user mode (contrast potential determination/gradation correction)
Feedback

	Control	Sensors	Destination of feedback
1	Initial rotation-less correction potential control	Potential sensor	Primary grid bias Developing bias
2	Initial drum surface potential control	Potential sensor	Primary grid bias Developing bias
3	Grid bias/developing bias control	Potential sensor	Primary grid bias Developing bias
4	Correction against changes in environment	Environment sensor	Primary grid bias Developing bias
5	Automatic gradation correction	————	Primary grid bias Developing bias

Table 3-501

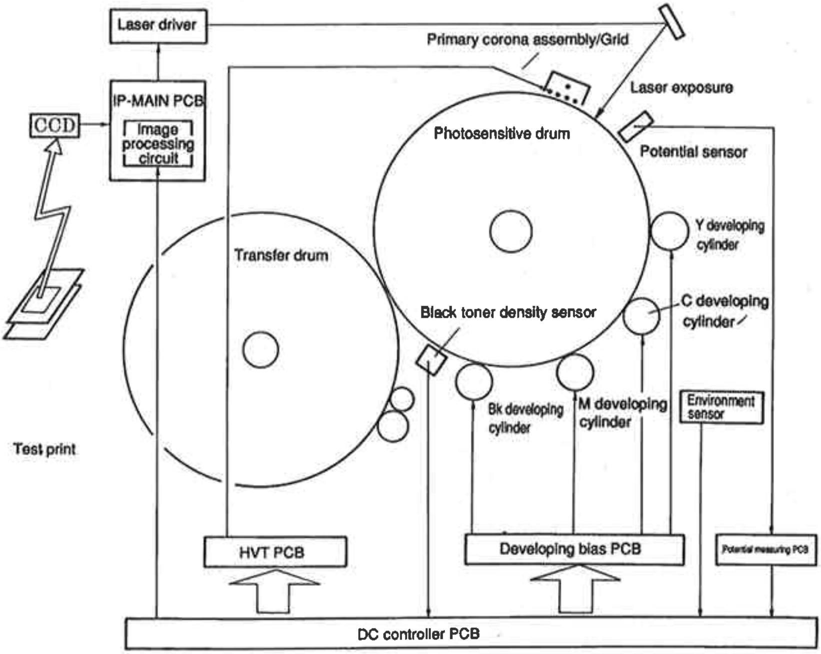

Laser driver
Primary corona assembly/Grid
Laser exposure
IP-MAIN PCB
Image processing circuit
CCD
Photosensitive drum
Potential sensor
Y developing cylinder
Transfer drum
C developing cylinder
Black toner density sensor
Bk developing cylinder
M developing cylinder
Environment sensor
Test print
HVT PCB
Developing bias PCB
Potential measuring PCB
DC controller PCB

Figure 3-503

2. Initial Rotation-less Correction Potential Control

a. Outline

Most conventional copiers execute initial rotation after a press on the Copy Start key to remove the charges from the drum surface and to even out the surface potential before starting copying operation. This copier, on the other hand, starts copying operation without such initial rotation to reduce the first copy time; this, however, is true of only when using cassette 1 as the paper source.

To compensate for the omission of initial rotation, the copier instead executes what is termed initial rotation-less correction potential control, whose data is used when making the first copy (from cassette 1).

For operation and timing, see "3. Controlling Initial Drum Surface Potential."

Reference:

Starting copying operation without initial rotation would result in different degrees of density between the first color of the first copy and the first color of the second copy in continuous copying mode caused by the difference in the surface potential occurring during the first rotation of the drum and the second and subsequent rotations.

3. Controlling the Initial Drum Surface Potential

a. Outline

The copier performs drum surface potential control at time of power-on to control the levels of the grid bias of the primary corona assembly and developing bias.

The copier executes initial drum surface potential control under the following conditions:

- When the temperature of the fixing roller is 110°C or less at power-on.
- Every 2 hr.
- When 'FUNC → EPC' is executed in service mode.

b. Surface Potential Measurement

The term *surface potential measurement* refers to taking measurements of the dark area potential (Vd) and light area potential (VL) occurring when the grid bias (Vg) of the primary corona assembly is set to the three levels shown in Table 3-502. The potential sensor measures Vd when the laser is turned off and VL when the laser is turned on.

(Vg1)	(Vg2)	(Vg3)
–300 V	–500 V	–700 V

Table 3-502

As shown in Figure 3-505, the grid bias is first set to Vg1, and Vd1/VL1 is measured; then, the grid bias is set to Vg2, and Vd2/VL2 is measured; and likewise, Vd3/VL3 is measured.

Based on the measurements of Vd1 through 3 and VL1 through 3, a graph of Vd and VL like the one shown in Figure 3-504 is prepared.

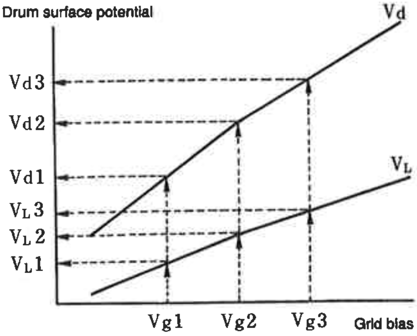


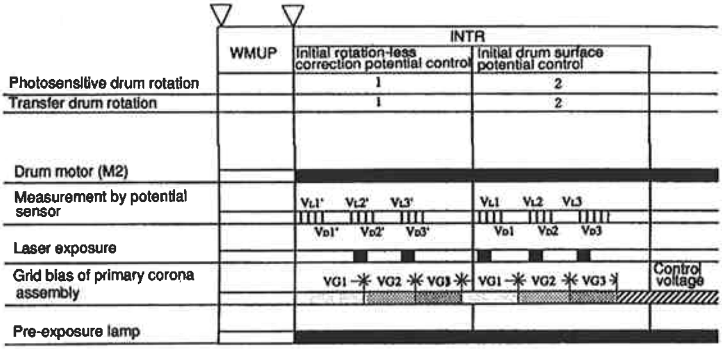
Figure 3-504

You can check the data (measurements) on the same screen by executing 'FUNC->EPC' in service mode; see the table for a guide when working in the field:

	Guide value
V00-300V	280~380
V00-500V	480~620
V00-700V	680~860
VFF-300V	35~145
VFF-500V	40~190
VFF-700V	45~235

Table 3-502A

- Sequence of Controlling Initial Drum Surface Potential


WMUP
INTR
Initial rotation-less correction potential control
Initial drum surface potential control
Photosensitive drum rotation
Transfer drum rotation
1
2
1
2
Drum motor (M2)
Measurement by potential sensor
VL1'
VL2'
VL3'
VD1'
VD2'
VD3'
VL1
VL2
VL3
VD1
VD2
VD3
Laser exposure
Grid bias of primary corona assembly
VG1
VG2
VG3
VG1
VG2
VG3
Control voltage
Pre-exposure lamp

V_L1 through V_L3 and V_D1' through V_D3' are used for the first color of the first copy when paper is from the cassette 1.

Figure 3-505

4. 'E061' (associated with drum surface potential control)

'E061' is an error code used to indicate faults associated with surface potential control.

The machine executes drum surface potential control during multiple initial rotation at power-on. The developing bias and the grid bias for each color are determined based on the measurement taken during the control and the pre-set contrast potential.

Go through the following for descriptions of how drum surface potential control is executed and computations are made, organized in relation to 'E061'.

a. explanation of the drum surface control procedure at power-on
b. explanation of the computation procedure and associated detailed codes

a. Drum Control Procedure at Power-On

Step	Drum rotation	Grid output	Laser output	Surface potential sensor
1	1st rotation	Vg1 (–300V) output	laser OFF (V00 output)	measures Vd1'
2			laser ON (VFF output)	measures VL1'
3		Vg2 (–500V) output	laser OFF (V00 output)	measures Vd2'
4			laser ON (VFF output)	measures VL2'
5		Vg3 (–700V) output	laser OFF (V00 output)	measures Vd3'
6			laser ON (VFF output)	measures VL3'
7	2nd rotation	Vg1 (–300V) output	laser OFF (V00 output)	measures Vd1
8			laser ON (VFF output)	measures VL1
9		Vg2 (–500V) output	laser OFF (V00 output)	measures Vd2
10			laser ON (VFF output)	measures VL2
11		Vg3 (–700V) output	laser OFF (V00 output)	measures Vd3
12			laser ON (VFF output)	measures VL3
13	Makes computations based on the result of measurement. (See next page.)			

b. Computation Procedure and Related Detailed Codes

Step	Description		Related detailed code	Meaning of detailed code	Possible cause
1	Back-up data check	Potential sensor offset value check.	0060	The potential offset value is 80 or less.	The potential sensor is faulty or not adjusted.
			0061	The potential offset value is 120 or more.	
2		Measurement check	0010	Vd1'/Vd2'/Vd3' is 20V or less.	The primary output is faulty.
			0011	Vd1' is 20V or less.	
			0012	Vd2' is 20V or less.	
			0013	Vd3' is 20V or less.	
			0018	Vd1/Vd2/Vd3 is 20V or less.	
			0019	Vd1 is 20V or less.	
			001A	Vd2 is 20V or less.	
			001B	Vd3 is 20V or less.	
			0020	Vd1'/Vd2'/Vd3' is 100V or less.	The grid bias output is faulty.
			0021	Vd1' is 100V or less.	
			0022	Vd2' is 100V or less.	
			0023	Vd3' is 100V or less.	
			0028	Vd1/Vd2/Vd3 is 100V or less.	
			0029	Vd1 is 100V or less.	
			002A	Vd2 is 100V or less.	
			002B	Vd3 is 100V or less.	
			0030	Vd1'/Vd2'/Vd3' is 900V or more.	The grid wire is broken.
			0031	Vd1' is 900V or more.	
			0032	Vd2' is 900V or more.	
			0033	Vd3' is 900V or more.	
			0038	Vd1/Vd2/Vd3 is 900V or more.	
			0039	Vd1 is 900V or more.	
			003A	Vd2 is 900V or more.	
			003B	Vd3 is 900V or more.	
3		Measurement comparison check	0040	The difference between Vd1' and Vd2' is 50V or less.	Primary/grid/pre-exposure lamp/poor contact/noise.
			0041	The difference between Vd2' and Vd3' is 50V or less.	
			0048	The difference between Vd1 and Vd2 is 50V or less.	
			0049	The difference between Vd2 and Vd3 is 50V or less.	
			0050	The difference between Vd1' and VL1', between Vd2' and VL2', and between Vd3' and VL3' are all 100V or less.	Laser output fault.
			0051	The difference between Vd1' and VL1' is 50V or less.	
			0052	The difference between Vd2' and VL2' is 80V or less.	
			0053	The difference between Vd3' and VL3' is 100V or less.	
			0058	The difference between Vd1' and VL1', between Vd2' and VL2', and between Vd3' and VL3' are all 100V or less.	
			0059	The difference between Vd1' and VL1' is 50V or less.	
			005A	The difference between Vd2' and VL2' is 80V or less.	
			005B	The difference between Vd3' and VL3' is 100V or less.	

Step	Description		Related detailed code	Meaning of detailed code	Possible cause
4	Computation	Computes the grid bias for each color based on the measurement.	xx04	The grid bias obtained from Vd1' through 3 and VL1' through 3 is 200V or less.	The photosensitive drum has deteriorated, or the laser output is faulty.
			xx05	The grid bias obtained from Vd1' through 3 and VL1' through 3 is 900V or more.	
			xx0C	The grid bias obtained from Vd1 through 3 and VL1 through 3 is 200V or less.	
			xx0D	The grid bias obtained from Vd1 through 3 and VL1 through 3 is 900V or more.	
5		Computes the laser output (V00) for each color based on measurement.	xx00	The laser output (V00) obtained from Vd1' through 3' and VL1' through 3' is 100V or less.	
			xx01	The laser output (V00) obtained from Vd1' through 3' and VL1' through 3' is 900V or more.	
			xx08	The laser output (V00) obtained from Vd1 through 3 and VL1 through 3 is 100V or less.	
			xx09	The laser output (V00) obtained from Vd1 through 3 and VL1 through 3 is 900V or more.	
6		Computes the developing bias for each color based on measurement.	xx06	The developing bias obtained from Vd1' through 3' and VL1' through 3' is 200V or less.	
			xx07	The developing bias obtained from Vd1' through 3' and VL1' through 3' is 700V or more.	
			xx0E	The developing bias obtained from Vd1 through 3 and VL1 through 3 is 200V or less.	
			xx0F	The developing bias obtained from Vd1 through 3 and VL1 through 3 is 700V or more.	
7		Computes the laser output (VFF) for each color based on measurement.	xx02	The laser output (VFF) obtained from Vd1' through 3' and VL1' through 3' is 10V or less.	
			xx03	The laser output (VFF) obtained from Vd1' through 3' and VL1' through 3' is 800V or more.	
			xx0A	The laser output (VFF) obtained from Vd1 through 3 and VL1 through 3 is 10V or less.	
			xx0B	The laser output (VFF) obtained from Vd1 through 3 and VL1 through 3 is 800V or more.	

5. Potential Measuring Circuit

Figure 3-508 is a block diagram of the potential measuring circuit.

A charge equivalent of the drum surface potential is induced on the electrode within the sensor by the work of an electrical power line and turned into an AC voltage by the opening/closing action of the chopper and sent to the pre-amplifier; thereafter, it is sent to the filter/gain adjusting circuit on the potential measuring PCB.

The filter/gain adjusting circuit removes electrical noise from the AC signals coming from the pre-amplifier of the sensor and, after further amplifying the AC signals, it sends them to the sync clamp circuit through a photocoupler.

The AC signals coming from the filter circuit and gain adjusting circuit and the sync signals which have been adjusted in the sync signal adjusting circuit are combined in the sync clamp circuit to identify whether the drum surface potential is positive or negative.

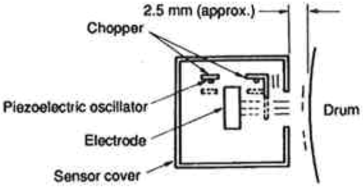

2.5 mm (approx.)
Chopper
Piezoelectric oscillator
Electrode
Sensor cover
Drum

Figure 3-506 Sensor Cross Section

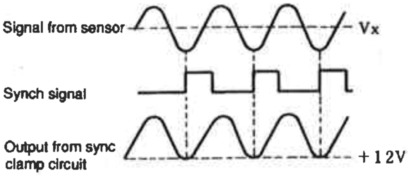

Signal from sensor
Vx
Synch signal
Output from sync clamp circuit
+12V

Figure 3-507 Surface Potential Greater than Sensor Bias

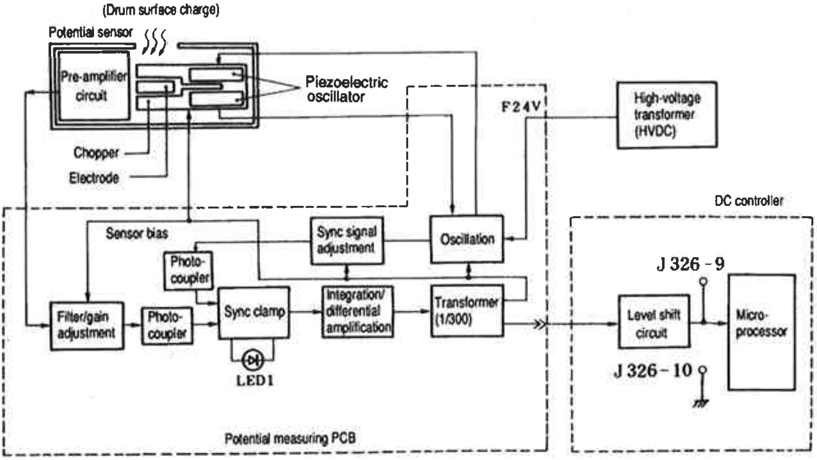

(Drum surface charge)
Potential sensor
Pre-amplifier circuit
Piezoelectric oscillator
Chopper
Electrode
F24V
High-voltage transformer (HVDC)
DC controller
Sensor bias
Photo-coupler
Sync signal adjustment
Oscillation
J 326 - 9
Filter/gain adjustment
Photo-coupler
Sync clamp
Integration/ differential amplification
Transformer (1/300)
Level shift circuit
Micro-processor
LED1
J 326 - 10
Potential measuring PCB

Figure 3-508

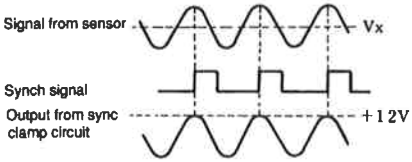


Figure 3-509 Sensor Bias Greater than Surface Potential

The output of the sync clamp circuit is processed (integrated) by the integrating circuit and is applied to the transformer. According to the output signal, the output of the transformer varies between 0 V and –600 V and is applied to the sensor; at the same time, its voltage is lowered to 1/300 and sent to the level shift circuit of the DC controller PCB.

A 0V-reference signal is converted to a 1V-reference signal and, at the same time, the signal is amplified (to about 1/255).

The level shift circuit output signal (analog) is sent to the microprocessor on the DC controller as it is.

a. Making Checks

① Checking Activation of LED1

Normally, LED1 remains on as long as the copier is supplied with power.

Otherwise, suspect that the F24V power is not supplied to the power supply or the potential measuring unit is faulty.

Reference:

You may assume that the potential sensor is operating normally if LED1 is on normally.

6. Setting the Grid Bias and Developing bias

The grid bias and developing bias DC component are determined based on VD and VL obtained by initial drum surface potential control and the target contrast potential obtained by automatic gradation correction control in user mode.

To ensure the absence of fogging on copies, a line is drawn for the developing bias DC (Vdc) at points (differ depending on moisture content) that represent the sum of Vd and Vback (about +120 V).

A point is located where the potential (contrast potential) between Vdc and VL is identical to the target contrast potential; see Figure 3-510.

Based on such a point, the target values for the gird bias and developing bias are obtained.

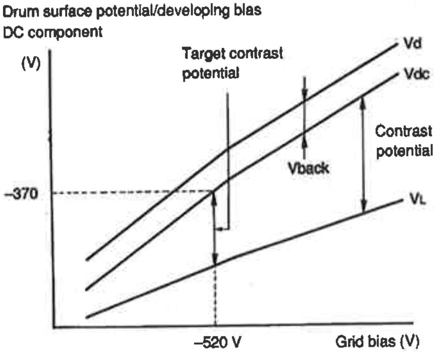


Figure 3-510

Reference:

- Target Contrast Potential

  The term *contrast potential* refers to a potential in between Vdc and VL (developing bias).

  The characteristics of the developer tend to change according to the environment around the developing assembly, affecting the density of the images. A constant degree of image density may be obtained unaffected by changes in the environment through controlling the contrast potential.

  See Figure 3-511 for the relationship between the changes in the environment and optimum contrast potential.

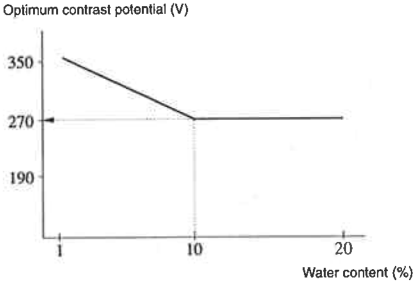


Figure 3-511

Conventional copiers determine the optimum contrast potential based on the data read by the environment sensor at time of power-on; by auto-matic gradation correction control.

Reference:

- Setting the Manual Contrast Potential
  To provide means for checking the potential control system, the copier offers seven-step contrast potential selections; you may select/switch any of the settings in service mode. However, note that individual contrast potential settings are fixed and cannot be varied.

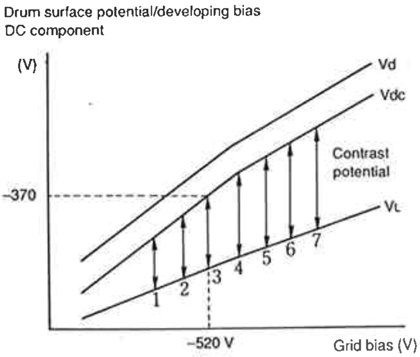


Figure 3-512

5. Correction against Changes in the Environment

The characteristics of the developer are subject to changes in the environment around the developing assembly, affecting the image density.

The copier is designed to find out the target contrast potential during automatic gradation correction control in user mode; in addition, to suit the changes that may have taken place in the environment, the copier is equipped with an environment sensor to monitor the temperature and humidity around the developing assembly. The copier corrects the target contrast potential based on the measurements taken by the sensor in response to each press on the Copy Start mode.

6. Automatic Gradation Correction Control in User Mode

The relationship between the laser output and the image density is as shown in Figure 3-513.

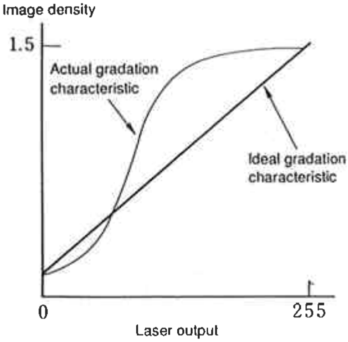


Figure 3-513

The copier actually develops, transfers, and fixes a solid patch of each color and of halftone in 64 gradations; the density of the output image is read by the CCD of the reader unit.

The contrast potential is determined based on the density data of each solid patch and the actual gradation characteristics are examined based on the density data of 64-gradation halftone outputs to correct the laser output, thereby realizing ideal gradation characteristics.

b. Operations

See Chapter 1 for how to make use of user mode.

1) In user mode, generate Test Print 1 for automatic gradation correction, i.e., halftone and solid patches (Figure 3-514).

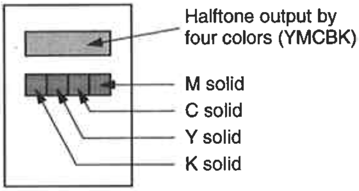


Figure 3-514 Test Print 1

2) On Test Print 1, check the density for difference and the images for faults; as necessary, perform the Basic Image Adjustment Procedure. If no fault is found, operate the reader unit to read in the solid images.
   The data representing these solid images is used to determine the contrast potential.
3) In user mode, generate Test Print 2 for automatic gradation correction (64 gradations for each color; Figure 3-515). At this time, the copier uses the contrast potential it determined in step 1 above.

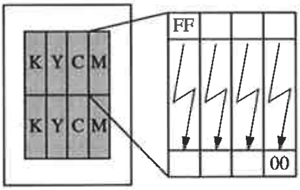


Figure 3-515 Test Print 2

4) Operate the reader unit to read Test Print 2.
   The copier prepares a graph representing the output and input values (Figure 3-513), and determines the correction value to ensure an ideal gradation characteristic.

D. Controlling the Grid Bias

1. Outline

The grid bias of the copier's primary corona assembly is controlled by the grid bias level signal (HVGI) from the DC controller PCB and sent to the HVT PCB; see Figure 3-516.

The grid bias level signal (HVGI) is an analog signal of between +8 V and +16 V generated by the DC controller PCB based on data obtained by controlling the potential. A grid voltage that corresponds to the grid bias level signal (HVGI) is applied to the grid wire of the primary corona assembly.

The HVT PCB also serves to supply the potential measuring PCB with power.

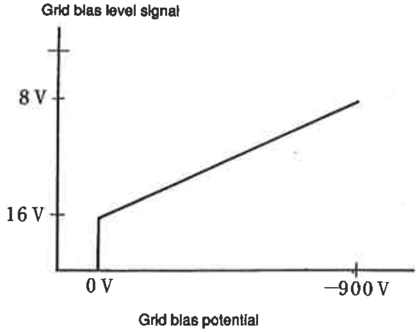


Figure 3-516

2. Operation

As long as the power switch remains on, the high-voltage control IC (IC1) on the HVT PCB keeps the grid bias drive signal (HVGC) on, and the grid bias high-voltage transformer remains on. If the grid bias level signal (HVGI) drops below 16 V, a grid bias corresponding to HVGI is supplied; at this time, the constant voltage control circuit feeds the grid bias voltage as reference to control the grid bias to a constant voltage.

The overcurrent detecting circuit is provided as a protection circuit; if a short-circuit or the like occurs on the grid wire, and the overcurrent detection signal (HVGOC) is sent to the high-voltage control IC (IC1), the high-voltage IC (IC1) causes the grid bias drive signal (HVGC) to remain '0' for 0.1 sec. Then, the circuit returns to normal; if the grid wire continues to have a short circuit, the entire copy will carry error images.

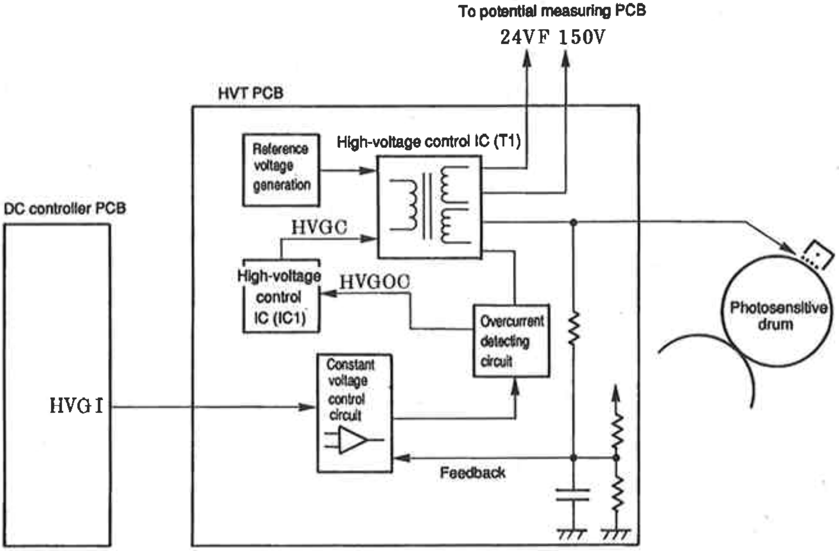

To potential measuring PCB
24VF 150V
HVT PCB
Reference voltage generation
High-voltage control IC (T1)
DC controller PCB
HVGC
High-voltage control IC (IC1)
HVGOC
Overcurrent detecting circuit
Photosensitive drum
Constant voltage control circuit
HVGI
Feedback

Figure 3-517

E. Controlling the Developing Bias

1. Outline

The copier's developing bias consists of double blank pulses and DC bias, and is generated in the developing bias PCB.

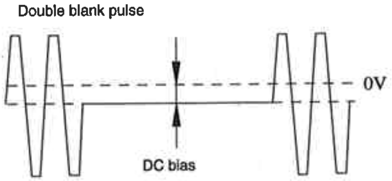


Figure 3-518

As shown in Figure 3-518, the developing bias PCB consists of the double blank pulse high voltage generating circuit, double blank pulse high voltage generating circuit, and double blank pulse output switching circuit used in common by four colors; in addition, it has two DC bias generating circuits, one each for M/Y and C/Bk. The double blank pulses generated by the circuit are switched into the two channels of MY/CBk by the double blank pulse output switching circuit and, after being synthesized with the DC bias, are sent to the output switching circuit; then, the pulses are sent to the developing assembly of each colors at such times as controlled by the DC controller PCB. As many as eleven lines of control signals from the DC controller PCB are sent to the developing bias PCB, each executing its respective control.

- Developing bias PCB drive control (DESBY)
- Double blank pulse on/off control (DBBPC1, DBBPC2)
- DC bias on/off control (DBDCC1, DBDCC2)
- DC bias application voltage level control (DBDCI1, DBDCI2)
- MCYBk switching control (DBS1, DBS2, DBS3, DBS4)

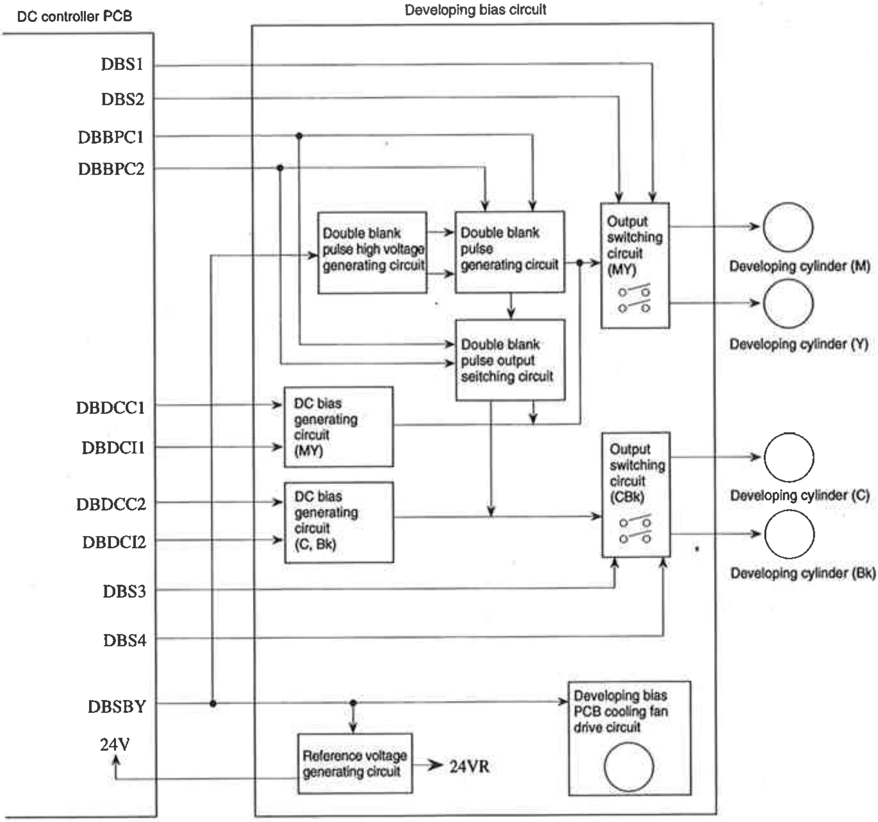

DC controller PCB
Developing bias circuit
DBS1
DBS2
DBBPC1
DBBPC2
Double blank pulse high voltage generating circuit
Double blank pulse generating circuit
Output switching circuit (MY)
Developing cylinder (M)
Developing cylinder (Y)
Double blank pulse output seitching circuit
DBDCC1
DBDCI1
DC bias generating circuit (MY)
DBDCC2
DBDCI2
DC bias generating circuit (C, Bk)
Output switching circuit (CBk)
Developing cylinder (C)
Developing cylinder (Bk)
DBS3
DBS4
DBSBY
24V
Reference voltage generating circuit
24VR
Developing bias PCB cooling fan drive circuit

Figure 3-519

2. Operation

a. Drive control of Developing Bias PCB

- DBSBY=0

→ Reference voltage generating circuit turns on and developing bias PCB cooling fan drive circuit turns on

→ Power supplied to each circuit and developing bias PCB cooling fan turns on

b. On/Off Control of Double Blank Pulses

- DBSBY=1

→ Double blank pulse high voltage generating circuit turns on

- DBBPC=1

→ High-voltage supplied to double blank pulse generating PCB

→ Double blank pulse output circuit turned on

c. On/Off Control of DC Bias and Level Control

The developing DC bias is turned on and off by DBDCC1 and DBDCC2; DBDCC1 is the drive signal of the Y/M bias generating circuit, and DBDCC2 is the drive signal of the C/K bias generating circuit.

Based on the data obtained by potential control, the DC controller generates the DC level signal (DBDCI1, DBDCI2) for the developing bias. DBDCI1 serves as the DC level signal for C and K; DBDCI1 and DBDCI2 are analog signals of between +8 V and +16 V, and a DC bias that corresponds to the DC level signal is sent to the output switching circuit.

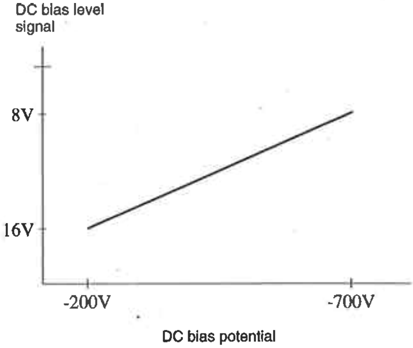


Figure 3-520

d. MCYBk Switching Control

The double blank pulses and DC bias are supplied to the developing cylinder after they are sent to the output switching circuit by the developing bias selection signal (DBS1, DBS2, DBS3, DBS4).

DBS1=1, DBS2, DBS3, DBS4=0: this condition supplies the M developing cylinder with a developing bias.

DBS2=1, DBS1, DBS3, DBS4=0: this condition supplies the Y developing cylinder with a developing bias.

DBS3=1, DBS1, DBS2, dBS4=0; this condition supplies the C developing cylinder with a developing bias.

DBS4=1, DBS1, DBS2, DBS3=0: this condition supplies the BK developing cylinder with a developing bias.

F. Controlling the Primary Corona Current

1. Outline

Figure 3-521 shows the circuit that controls the primary corona and has the following functions.

- Turns on and off the primary corona current. The copier's primary corona current output is controlled to a specific current to eliminate the effects of changes in the environment on the corona discharge.

2. Operation

The primary corona current is turned on and off by the primary corona current on signal (HVPR*).

- HVPR*=0
  Variable pulse width oscillating circuit turns on.
  Primary high-voltage transformer turns on.
- HVPR*=1
  Variable pulse width oscillating circuit turns off.
  Primary high-voltage transformer turns off.

The level of the primary corona current is fed back to the variable width oscillating circuit; a specific current is maintained through comparison of the level against the reference voltage.

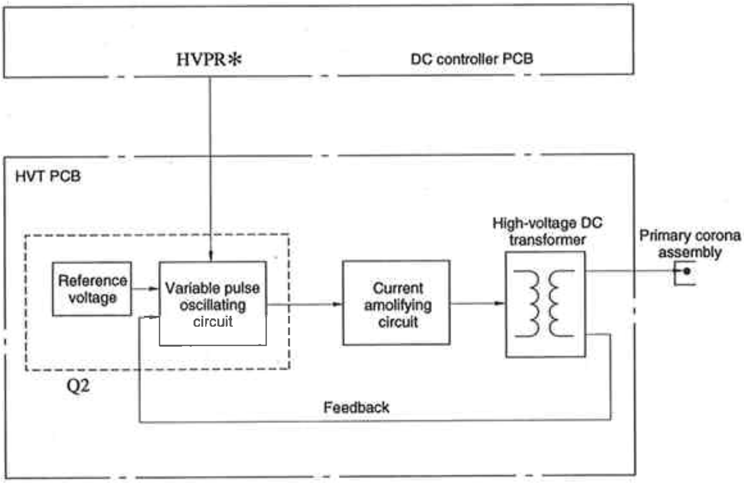

HVPR*
DC controller PCB
HVT PCB
High-voltage DC transformer
Primary corona assembly
Reference voltage
Variable pulse oscillating circuit
Current amolifying circuit
Q2
Feedback

Figure 3-521

G. Controlling the Attraction Charge Current

1. Outline

Figure 3-522 is a block diagram of the retention charge current control circuit.

The circuit is controlled by the retention charge current on/off control signal (HVATC) and retention charge current level control signal (HVATI) from the DC controller PCB.

The DC controller PCB generates HVATI of an appropriate level according to the type of copy paper (plain, thick, transparency) and the temperature and humidity registered by the environment sensor. The circuit controls the retention charge current to a specific level of current as in the case of the primary corona current.

To suit the selected copy mode, the potential of the transfer drum sheet is controlled between –7.5 kV and +5 kV while the retention brush is on.

To enable this, the circuit is provided with a mechanism that shifts the high-voltage output between positive and negative polarities depending on the output current.

2. Operation

HVATC=1

→ A charge current according to the level of HVATI (8 V to 16 V) is generated.

HVATC=0

→ The charge current output is '0' regardless of the level of HVATI.

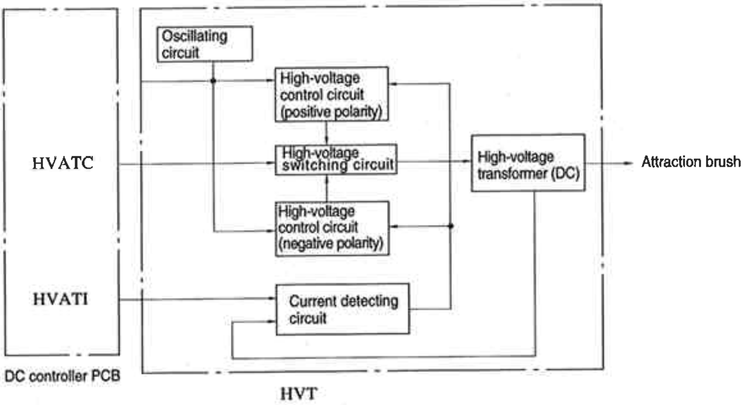

Oscillating circuit
High-voltage control circuit (positive polarity)
HVATC
High-voltage switching circuit
High-voltage transformer (DC)
Attraction brush
High-voltage control circuit (negative polarity)
HVATI
Current detecting circuit
DC controller PCB
HVT

Figure 3-522

H. Controlling the Transfer Charge Current

1. Outline

Figure 3-523 is a block diagram of transfer charge current control circuit.

The circuit is controlled by the transfer charge current on/off control signal (HVTRC) and transfer charge current level control signal (HVTRI) from the DC controller PCB.

The DC controller PCB generates HVTRI of an appropriate level to suit the type of copy paper (plain, thick paper, transparency) and the temperature and humidity registered by the environment sensor. The circuit controls the transfer charge current to a specific level of current as in the case of the primary corona current.

To suit the selected copy mode, the potential of the transfer drum sheet is controlled to any of four settings between –7.5 kV and +5 kV while the transfer brush is on.

To enable this, the circuit is equipped with a mechanism that switches the high-voltage between positive and negative polarities according to the output current.

2. Operation

HVTRC=1

→ A charge current according to the level of HVTRI (8 V to 16 V) is generated.

HVTRC=0

→ The charge current output is '0' regardless of the level of HVTRI.

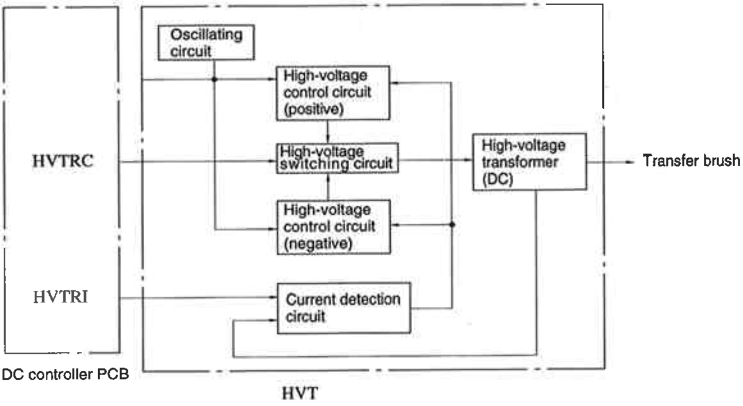

HVTRC
HVTRI
DC controller PCB
Oscillating circuit
High-voltage control circuit (positive)
High-voltage switching circuit
High-voltage control circuit (negative)
Current detection circuit
High-voltage transformer (DC)
Transfer brush
HVT

Figure 3-523

I. Controlling the Separation Charge Current

1. Outline

Figure 3-524 is a block diagram of the separation corona charging assembly control circuit.

The circuit is controlled by the separation charge on/off control signal (HVSPC) and separation charge level control signal (HVSPI) from the DC controller PCB.

The DC controller PCB generates HVSPI of an appropriate level to suit the type of copy paper (plain, thick paper, transparency) and the temperature and humidity registered by the environment sensor. The circuit controls the charge current (DC bias component) to a constant current level; it also controls the charge voltage (AC component) to a specific voltage level.

2. Operation

HVSPC=1

→ High voltage according to the level of HVSPI (8 V to 16 V) is generated.

HVSPC=0

→ The high-voltage output is '0' regardless of the level of HVSPI.

Reference:

Stray toner occurring as a result of separation charges will not be a problem in a high-humidity environment and, therefore, the corona output is controlled so that it is '0'.

At time of shipment, the machine is adjusted so that it identifies a high-humidity condition at '8.5 g' or higher ('DISPLAY: ANALOG: BODY g' in service mode).

The separation corona output and the humidity slice level (machine inside humidity absolute value) may be varied in service mode (ADJUST: HV-SP, SP-OFST).

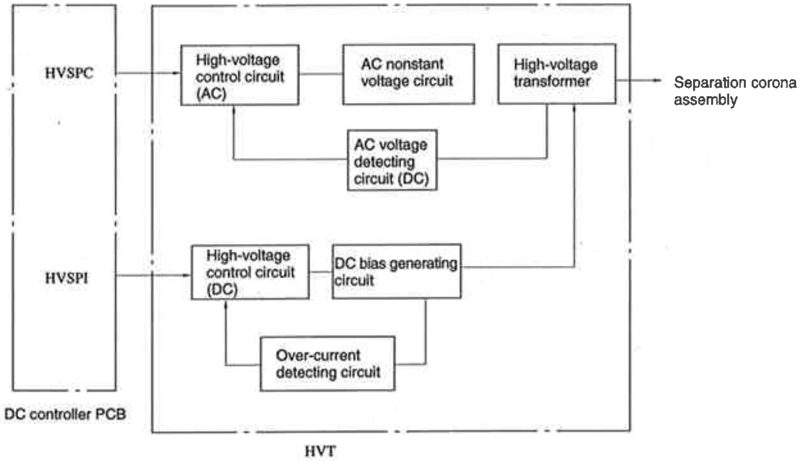

HVSPC
HVSPI
DC controller PCB
High-voltage control circuit (AC)
AC nonstant voltage circuit
High-voltage transformer
Separation corona assembly
AC voltage detecting circuit (DC)
High-voltage control circuit (DC)
DC bias generating circuit
Over-current detecting circuit
HVT

Figure 3-524

J. Controlling the Static Eliminator Current

1. Outline

Figure 3-525 is a block diagram of the static eliminator corona assembly control circuit.

The circuit controls the charge current of the external/internal static eliminator to a constant current level.

The circuit controls the internal static eliminator and external static eliminator separately based on the static eliminator charge on/off control signal (O-REM, I-REM) from the DC controller.

2. Operation

I-REM=1

→ The high voltage of the internal static eliminator is generated.

I-REM=0

→ The high voltage of the internal static eliminator is '0'.

O-REM=1

→ The high voltage of the external static eliminator is generated.

O-REM=0

→ The high-voltage of the external static eliminator is '0'.

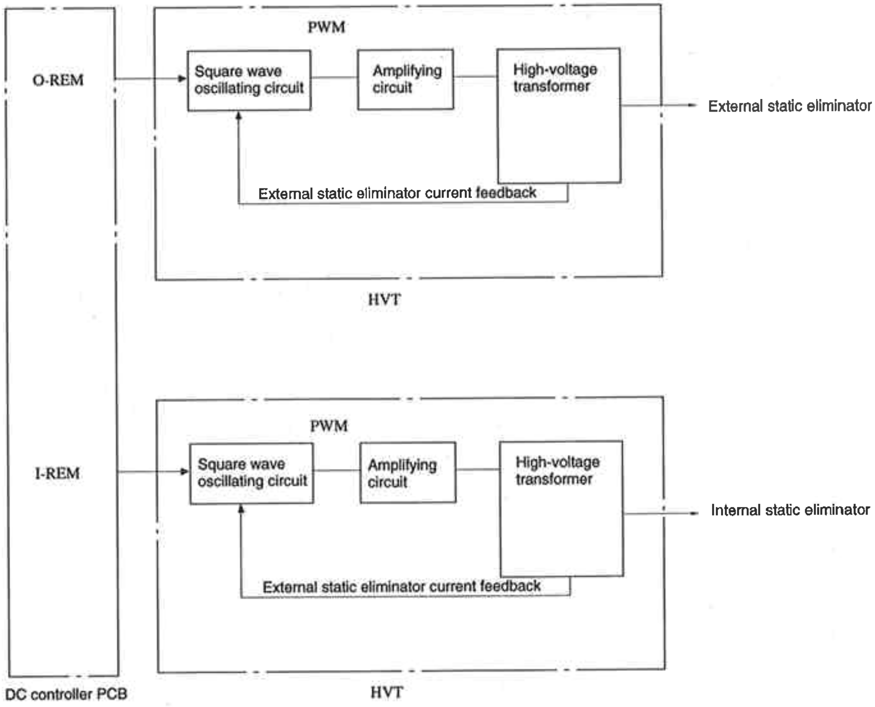

PWM
O-REM
Square wave oscillating circuit
Amplifying circuit
High-voltage transformer
External static eliminator
External static eliminator current feedback
HVT
PWM
I-REM
Square wave oscillating circuit
Amplifying circuit
High-voltage transformer
Internal static eliminator
External static eliminator current feedback
DC controller PCB
HVT

Figure 3-525

K. Controlling the Photosensitive Drum Temperature

1. Outline

The sensitivity of the photosensitive drum varies according to the site environment (temperature and humidity).

To prevent changes in the sensitivity of the drum, a drum heater (60 W) is installed along the drum axis to control the temperature around the drum to a specific value.

2. Control System

When the power saving switch (SW10) is at its normal position, the drum heater is supplied with power regardless of the position of the main switch; when the power saving switch is at the saving position, the drum heater is supplied with power only when the main switch is turned on. (See Figure 3-528.)

The temperature around the drum is monitored by the thermistor nearby, and communicated to the drum heater controller PCB. If the temperature around the drum is lower than a specific value, the drum heater is supplied with power through an SSR.

If the temperature rises to an error temperature, the control IC cuts off power to the drum heater.

Specific temperature ... 33°C (26°C)

High-temperature error temperature ... 50°C

To limit the consumption of power, the DC controller PCB generates the DRHOFF signal to cut out power to the drum heater through the SSR2 when another heater is on (115 V only).

If the DC controller identifies an error in the machine (fault in the fixing heater, for example), the SHUTOFF* signal turns off the main switch to cut out power to the drum heater.

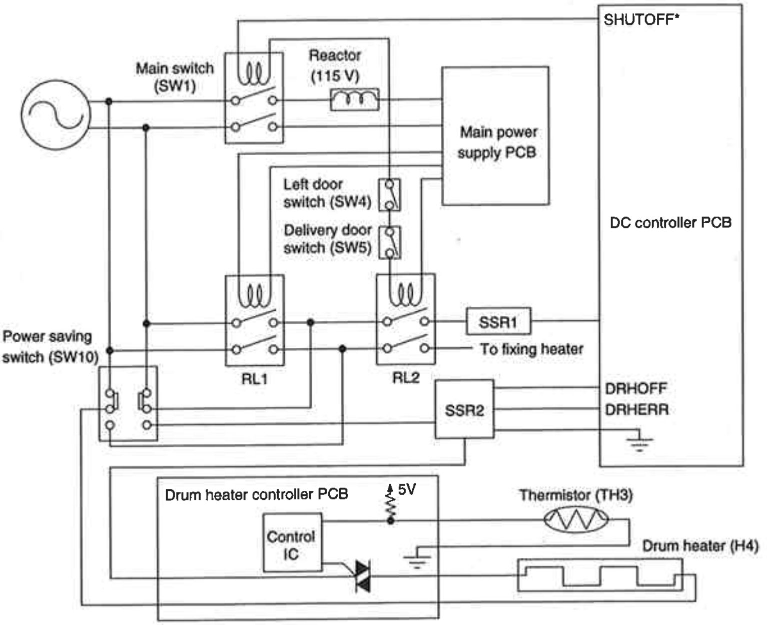

SHUTOFF*
Main switch (SW1)
Reactor (115 V)
Main power supply PCB
DC controller PCB
Left door switch (SW4)
Delivery door switch (SW5)
SSR1
To fixing heater
Power saving switch (SW10)
RL1
RL2
SSR2
DRHOFF
DRHERR
Drum heater controller PCB
5V
Control IC
Thermistor (TH3)
Drum heater (H4)

Figure 3-526

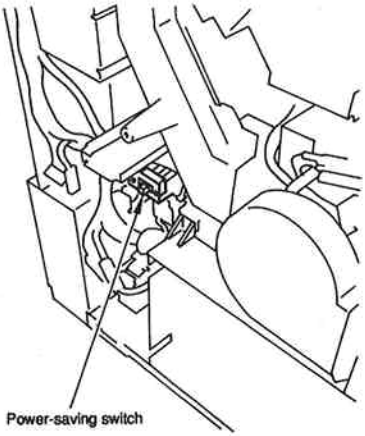

Power-saving switch

Figure 3-527

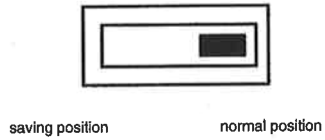

saving position
normal position

Figure 3-528 Power-Saving Switch (Rear View)

L. Controlling the Primary Corona Wire

1. Outline

The copier is equipped with an automatic cleaning mechanism for the primary corona wire which operates under the following conditions:

① When the DC controller identifies that the temperature of the fixing assembly is 130°C or less when the power is switched on.
② When primary corona wire cleaning is executed in user mode.
③ When image formation has been executed 2000 times on the photosensitive drum.

2. Operation

The primary corona wire cleaning motor (M7) is rotated in normal direction for about 12 sec; the cleaning felt is moved forward and butted against the rear.

After this normal rotation is over, the motor is rotated in reverse for about 12 sec; the cleaning felt moves in reverse and returns to the front.

The protection resistor is used to control overcurrent occurring when the cleaning felt butts against the front or rear.

Reference:

M7FW=1, M7RV=0
↳ Normal rotation
M7FW=0, M7RV=1
↳ Reverse rotation

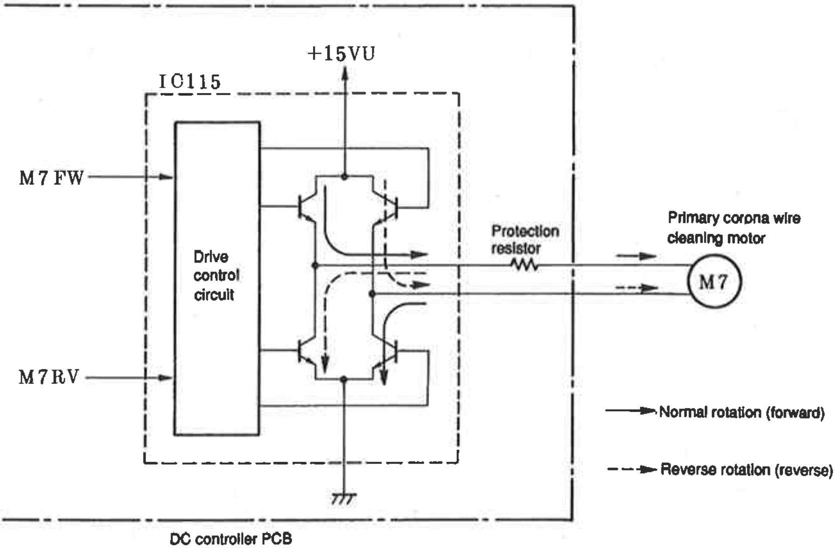

+15VU
IC115
M7 FW
M7RV
Drive control circuit
Protection resistor
Primary corona wire cleaning motor
M7
Normal rotation (forward)
Reverse rotation (reverse)
DC controller PCB

Figure 3-529

M. Developing Assembly/Photosensitive Drum Cleaning Assembly

1. Outline

The developing assemblies for four colors are arranged around the photosensitive drum. Each of the developing assembly is engaged by the drive of the main motor transmitted by the developing assembly engagement solenoid (SL1 through SL4). The drive of the main motor is transmitted to the developing cylinder when the developing cylinder clutch (CL1 through CL4) turns on.

The density of toner inside the developing assembly is detected by the color toner density sensor (ATR1 through ATR3) and black toner density sensor (ATR4) when the developing assembly is engaged with the photosensitive drum.

When the toner density drops below the specified value, the toner supply clutch (CL5 through CL8) turns on to transmit the drive of the hopper motor to the hopper, thereby supplying toner.

The toner level sensor (TS1 through TS4) checks to see if the level of toner inside the hopper has dropped below the specified level.

The waste toner collected by the photosensitive drum cleaning assembly is forwarded to the waste toner container by the drive of the main motor. The waste toner pipe is equipped with a waste toner feed screw lock detection switch (MS4) and the waste toner container is equipped with a waste toner full sensor (PS42).

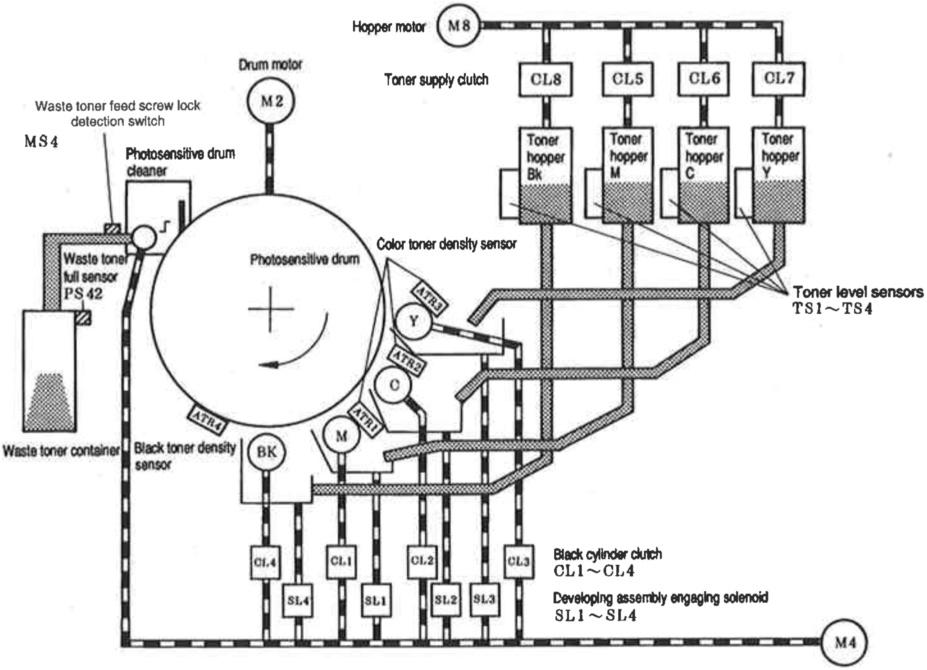

Hopper motor
M8
Drum motor
M2
Toner supply clutch
CL8
CL5
CL6
CL7
Toner hopper Bk
Toner hopper M
Toner hopper C
Toner hopper Y
Waste toner feed screw lock detection switch
MS4
Photosensitive drum cleaner
Waste toner full sensor
PS42
Photosensitive drum
Color toner density sensor
ATR3
Y
ATR2
C
ATR1
M
ATR4
BK
Toner level sensors
TS1~TS4
Waste toner container
Black toner density sensor
CL4
CL1
CL2
CL3
SL4
SL1
SL2
SL3
Black cylinder clutch
CL1~CL4
Developing assembly engaging solenoid
SL1~SL4
M4

Figure 3-530

2. Developing Assembly Engagement

When the developing assembly engaging solenoid (SL1 through SL4) turns on, the developing assembly engaging cam rotates, and the developing assembly is engaged with the photosensitive drum by the drive of the main motor.

Figure 3-531 shows the state in which the cyan developing assembly is engaged.

In case of making a 4-color copy, the developing assemblies are engaged in the order of M, C, Y, and Bk.

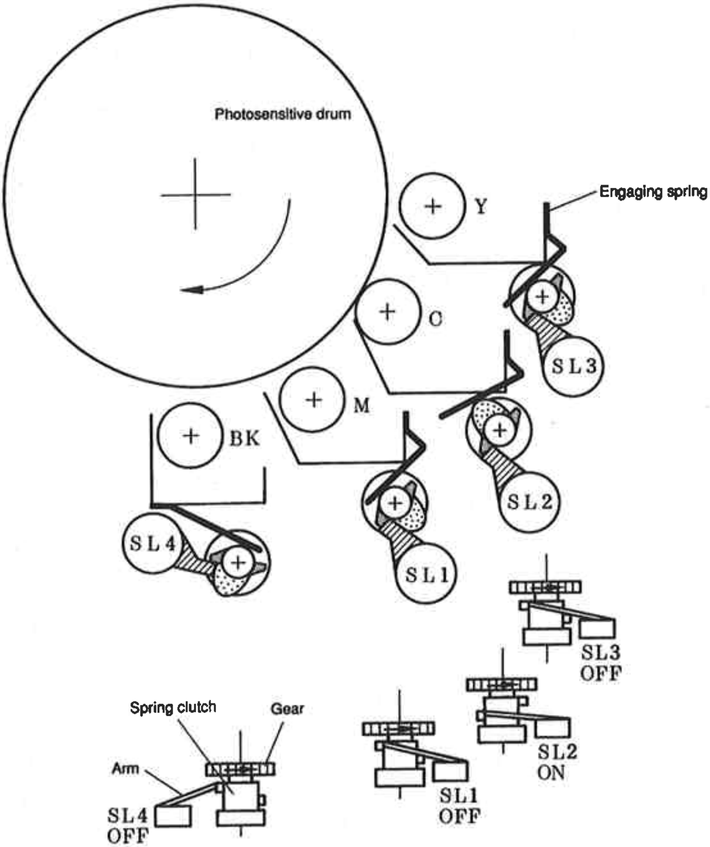

Photosensitive drum
Y
Engaging spring
C
SL3
M
BK
SL2
SL4
SL1
SL3
OFF
Spring clutch
Gear
SL2
ON
Arm
SL1
OFF
SL4
OFF

Figure 3-531 C Developing Assembly Engagement

3. Detecting the Color Toner Density

a. Outline

Each of the developing assemblies (M, C, and Y) is equipped with a single color toner density sensor, which checks the density of the developer inside any of the operating developing assembly during copying operation.

The sensors are of a photoelectric type, and detects the light (near infrared) reflected by the developing cylinder by a photodiode; toner is supplied according to the difference between the reading and the initial setting.

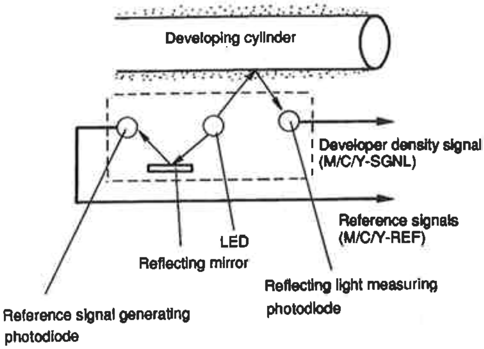

Developing cylinder
Developer density signal (M/C/Y-SGNL)
Reference signals (M/C/Y-REF)
LED
Reflecting mirror
Reflecting light measuring photodiode
Reference signal generating photodiode

Figure 3-532

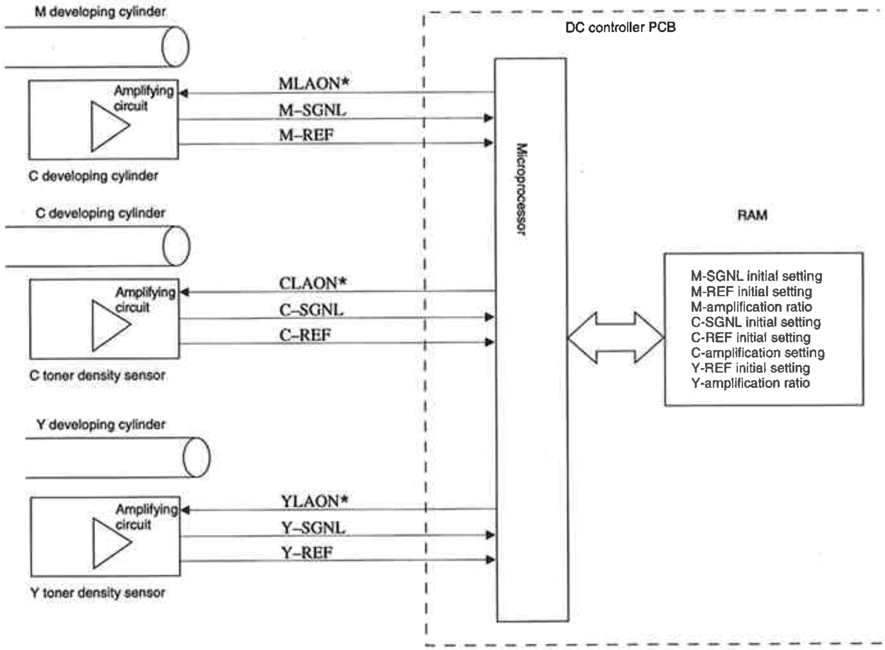

M developing cylinder
Amplifying circuit
MLAON*
M-SGNL
M-REF
C developing cylinder
C developing cylinder
Amplifying circuit
CLAON*
C-SGNL
C-REF
C toner density sensor
Y developing cylinder
Amplifying circuit
YLAON*
Y-SGNL
Y-REF
Y toner density sensor
DC controller PCB
Microprocessor
RAM
M-SGNL initial setting
M-REF initial setting
M-amplification ratio
C-SGNL initial setting
C-REF initial setting
C-amplification setting
Y-REF initial setting
Y-amplification ratio

Figure 3-533

Reference:

This mechanism of detection takes advantage of the fact that both paint and toner reflect infrared light but the carrier (iron powder) of the developer absorbs it. In other words, the infrared light reflected by the developer decreases as the toner inside the developer decreases.

In addition to the photodiode used to detect the density of toner, each sensor possesses a photodiode that generates reference signals used to detect the deterioration of the LED.

The copier's color toner density detection/adjustment is executed in response to a command in service mode after supplying the starter developer.

b. Initial Settings
(FUNC, INSTALL, INIT-M/C/Y)

You must execute 'FUNCT', 'INSTALL,' and 'INIT-M/C/Y' at time of installation or whenever you have replaced the developer or the toner density sensor.

The copier's 'INIT-M/C/Y' automatically executes the following functions, which are executed by a hardware VR and in service mode in the existing models.

- reads the reference signal (REF-M/C/Y)
- sets the gain (SGAIN-M/C/Y)
- reads the initial developer density signal (SGNL-M/C/Y)
- writes the REF-M/C/Y, SGAIN-M/C/Y, and SGNL-M/C/Y values into RAM

c. Detecting the Density

A LED is turned on while the developing cylinder is rotating with the developing assembly engaged with the photosensitive drum. The microprocessor reads the toner density signal and reference signals, and compares them against the initial reading stored in RAM to compute the change that may have taken place in the density.

The copier determines the amount of toner to be fed based on this change in density, and supplies toner from the hopper.

See Table 3-503 for the names of the signals and the names used in service mode.

Signal	Adjustment	Notation in service mode
Y reference signal (Y-REF)	—	REF-Y
C reference signal (C-REF)	—	REF-C
M reference signal (M-REF)	—	REF-M
M toner density signal (M-SGNL)	818 ±41	SGNL-M
C toner density signal (C-SGNL)	818 ±41	SGNL-C
Y toner density signal (Y-SGNL)	818 ±41	SGNL-Y

Table 3-503

4. Measuring the Black Toner Density

a. Outline

The black toner density sensor is found outside the photosensitive drum, and is used to measure the density of the toner image of black (Bk) that has been developed on the photosensitive drum.

Like the color toner density sensor inside each of the developing assemblies (MCY), the black toner density sensor is of a photoelectric type, which detects the light reflected by the toner on the drum by a photodiode.

The copier also executes LED deterioration correction and window dirt correction to ensure accurate measurement of the toner density.

The copier's black toner density detection/adjustment is executed in response to a command in service mode after supplying the starter developer.

Reference:

Each type of toner (MCY) reflects infrared light emitted by a LED; however, Bk toner absorbs infrared light.

With reference to the reflection rate of the photosensitive drum, the following is true:

Bk toner < photosensitive drum < MCY toner

Taking advantage of such a characteristic, the copier measures the density of Bk toner on the drum.

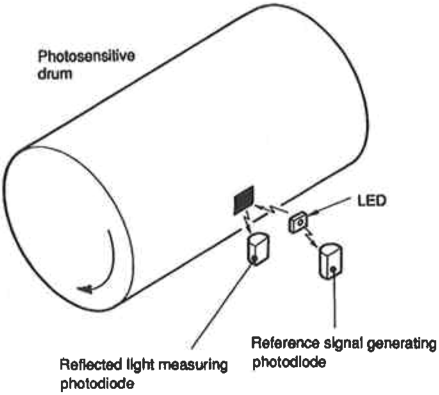

Photosensitive drum
LED
Reference signal generating photodiode
Reflected light measuring photodiode

Figure 3-534

b. Initial Settings (FUNC, INSTALL, INIT-K)

You must execute 'FUNCT', 'INSTALL,' and 'INIT-K' at time of installation or whenever you have replaced the developer or the toner density sensor.

The copier's 'INIT-K' automatically executes the following functions, which are executed by a hardware VR and in service mode in the existing models.

- reads the reference signal (REF-K/D)
- sets the gain (SGAIN-K, RGAIN-K)
- reads the initial developer density signal/drum surface density signal (SGNL-K/D)
- writes the REF-K/D, SGAIN-K, RGAIN-K, and SGNL-K/D values into RAM

c. Detecting the Density

A black toner image is developed on the photosensitive drum, and the LED of the Bk toner density sensor is turned on. The microprocessor reads the black toner density signal and reference signal and compares them against the initial settings stored in RAM to compute the change in the density.

Toner is supplied by the hopper according to the change so computed.

See Table 3-504 for the signal names and the names used in service mode.

Signal name	Standard	Name in service mode
Bk toner density signal (Bk-SGNL)	375 ± 35	SGNL-K
	614 ± 21	SGNL-D
Bk reference signal (Bk-REF)	818 ± 41	REF-K
	818 ± 41	REF-D

Table 3-504

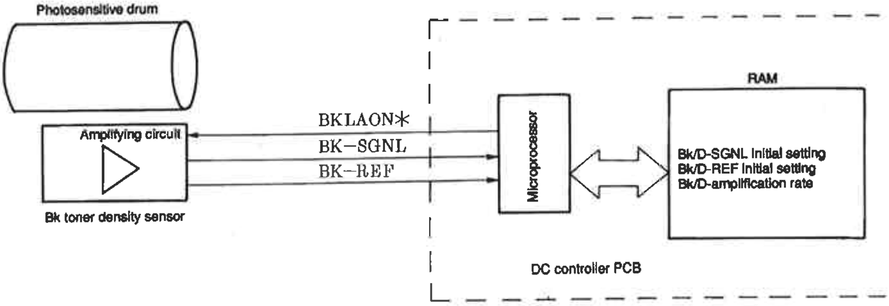

Photosensitive drum
Amplifying circuit
Bk toner density sensor
BKLAON*
BK−SGNL
BK−REF
Microprocessor
RAM
Bk/D-SGNL initial setting
Bk/D-REF initial setting
Bk/D-amplification rate
DC controller PCB

Figure 3-535

d. Detecting Dirt on the Window

At power-on and during control rotation (CNTR) that follows a press on the Copy Start key, a LED is turned on to measure Bk-SGNL without toner on the photosensitive drum; at this time, the value of Bk-SGNL is small if the sensor window is soiled. The ratio of the reading of Bk-SGNL and specified value is stored as a correction value, and is used to correct the sensor output for toner density control (inside black developing assembly).

If the measurement Bk-SGNL is 75% or less of the specified value, the copier indicates 'E020'.

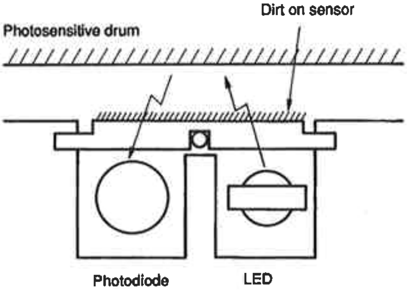


Figure 3-536

e. Controlling the Density of Toner Inside the Black Developing Assembly

When the black developing assembly is engaged with the photosensitive drum, the laser is turned on to form a black toner image on the photosensitive drum. A LED is turned on immediately before the black toner image moves past the front of the sensor, and the black toner density signal and reference signal are read while the image is moving past the sensor. These signals are compared against the window dirt correction value and the initial setting stored in RAM to obtain the change that may have occurred in density.

According to the change, the copier determines the amount of toner and supplies toner from the hopper.

Reference:

Unlike YMC toners, the copier's black toner absorbs near infrared light; for this reason, exposure of the developer with near infrared light will not enable detection of the amount of toner in the developer.
Since the photosensitive drum reflects near infrared, however, exposure of the black toner image on the drum enables detection of the density of the toner.
In other words, a decrease in the amount of toner in the developer results in a decrease in the density of the black toner image, thereby increasing the reflected light.

Reference:

It is important to prevent adhesion of toner from the photosensitive drum to the transfer sheet when the density of black toner is detected during copying operation; to do so, the DC controller PCB must turn on the laser when the black toner image comes into contact with the metal transfer sheet for transfer to the transfer drum.

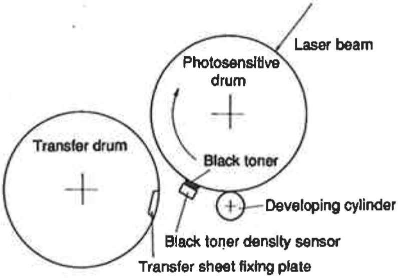


Figure 3-537

5. Error Code (E020) Associated with Controlling the Toner Density

1. E020

'E020' is an error code associated with toner density faults (ATR control).

ATR control may be used either when making initial settings at time of machine installation and developer replacement or when maintaining the toner density inside the developing assembly to a constant level as part of the copying sequence. In addition, control is executed differently between Bk toner and M/C/Y toner.

Here, the discussions are divided into ATR for Bk toner and ATR for M/C/Y toner, and 'E020' is explained together with detailed codes in relation to a series of operations.

a. Flow and Related Detailed Codes (initial setting for Bk developer)
b. Flow and Related Detailed Codes (initial setting for M/C/Y developer)
c. Bk – Related Flow and Detailed Codes at Power – On
d. Bk Toner Density Control Flow and Relate Detailed Codes during Copying Operation
e. M/C/Y Toner Density Control Flow and Related Detailed Codes during Copying Operation

a. Flow and Related Detailed Codes (initial setting for Bk developer)

Initial setting flow		Operation	Related detailed code		Error detection
1. Supplying developer (FUNC → INSTALL → SPLY-K)		Developer is put into the developing assembly.			
2. Stirring (FUNC → INSTALL → STIR)		The developer inside the developing assembly is stirred.			
3. Reading the initial setting (FUNC → INSTALL → INIT-K)	3.1 Idle rotation (30 sec)	The developer inside the developing assembly is stirred.			
	3.2 Determining SGAIN-K/ RGAIN-K	The LED on the BK toner sensor is turned on, and its direct light is detected by the photosensor 1 while its light reflected by the drum surface is detected by the photosensor 2 to convert the intensity into a voltage. Based on the measurement, SGAIN-K/ RGAIN-K is determined. • Sets the gain (RGAIN-K) so that the intensity detected by the photosensor 1 is 4 V. • Sets the gain (SGAIN-K) so that the intensity detected by the photosensor 2 is 3 V.	SG AIN-K	0432	SGAIN-K is 0.
				0442	SGAIN-K is 255.
				0450	GAIN cannot be set.
			RGAIN-K	0433	RGAIN-K is 0.
				0443	RGAIN-K is 255.
				0451	GAIN cannot be set.
	3.3 Reading SGNL-D/ REF-D	After determining GAIN, the LED is turned on once again; its direct light is detected by the photosensor 1 and converted into voltage based on the gain determined in 3-2 to obtain REF-D; then, the light reflected by the drum surface is converted into voltage based on the gain determined in 3-2 to obtain SGNL-D.	SGNL-D	0410	The variation within a single sampling is 102 or more.
				0420	The variation within 16 samplings is 102 or more.
			REF-D	0400	The value of REF-D is 50 or less; displaced connector, faulty sensor.
				0411	The variation within a single sampling is 102 or more
				0421	The variation within 16 samplings is 102 or more.
	3.4 Reading SGNL-K/ REF-K	A total of 16 halftone BK patches (8 × 2 rotations) are made on the photosensitive drum, and the LED is turned on while doing so; its direct light is detected by the photosensor 1 to obtain REF-K as in 3-3; then, the light reflected by a patch on the drum surface is detected by the photosensor 2 to obtain SGNL-K.	REF-K	0400	The value of REF-K is 50 or less; displaced connector, faulty sensor.
				0411	The variation of a single sampling is 102 or more.
				0421	The variation within 16 samplings is 102 or more.
	3.5 End (or re-measurement)	The flow is complete when the value of SGNL-K is 375 ±35. Otherwise, the Bk patch density level is changed and 3-4 is repeated. The density level is changed and measurements are taken for a maximum of two times; if SGNL-K is not 375 ±35 after a total of three tries, an error is issued. The change in the density level of the patches is based on PT-OFST (e.g., if PT-OFST=10, the image density is increased by 10 levels).		0431	The initial setting is 777 or less.
				0441	The initial setting is 859 or more.
			SGNL-K	0410	The variation within a single sampling is 102 or more.
				0420	The variation within 16 samplings is 102 or more.
				0430	The initial setting is 340 or less.
				0440	The initial setting is 410 or more.

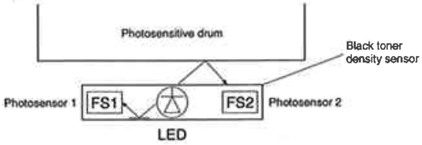


Figure 3-538

b. Flow and Related Detailed Codes (initial setting for M/C/Y developer)

XX indicates the color of the developing assembly (toner). xx = 01: M, xx = 02: C, xx = 03: Y

Initial setting flow		Operation	Related detailed code	Error detection
1. Supplies developer				
2. Stirs developer (FUNC –> INSTALL –> STIR)				
3. Reads initial settings (FUNCT –> INSTALL –> INTT - K)	3.1 Reads the reference signals "REF - M/C/Y".	Turns on the LED in each toner sensor, and the direct light is received by the Photosensor 1 to measure and convert the light into voltage. Takes 16 samplings, each sampling consisting of 10 measurements.	xx00	The connector is disconnected.
			xx11	The variation of 10 measurements within a single sampling is 41 or more.
			xx21	The variation in 16 samplings is 41 or more.
			xx31	The setting of "REF - M/C/Y" is 144 or less.
			xx41	The setting of "REF - M/C/Y" is 920 or more.
	3.2 Sets the gains "SGAIN - M/C/Y".	Sets the gain so that the voltage measured in 3.1 will be 4V.	xx32	The setting of "SGAIN - M/C/Y" is 0.
			xx42	The setting of "SGAIN - M/C/Y" is 255.
			xx50	The gain cannot be set.
	3.3 Reads the initial settings "SGNL - M/C/Y".	Turns on the LED in each toner sensor, and the light is directed to the developing cylinder; the reflected light is measured by the photosensor 2 and converted into voltage. (The value is "SGNL - M/C/Y".) Takes 10 samplings, each sampling consisting of 10 measurements.	xx10	The variation in the settings of "SGNL - M/C/Y" within a single sampling is 41 or more.
			xx20	The variation in the settings of "SGNL - M/C/Y" within 16 samplings is 41 or more.
			xx30	The setting of "SGNL - M/C/Y" is 777 or less.
			xx40	The setting of "SGNL - M/C/Y" is 859 or more.

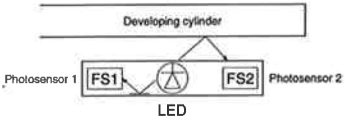


Figure 3-539

c. Bk - Related Flow and Detailed Cods at Power - On

Initial setting flow		Operation	Related detailed code	Error detection
1.	Power switch on (starts initial multiple rotation)			
2. Checks soiling of window	2.1 Reads "SGNL - D".	Turns on the LED in the Bk toner sensor, and the direct light is received by the photosensor 2 to measure and convert the light into voltage.		
	2.2 Makes comparisons and computations.	Compares "SGNL - D" read in 2.1 against "SGNL - D" read in initial setting in 2.1 and stored in memory.	0460	There is a decrease in intensity of 40% or more when compared against "SGNL - D" read during initial setting.
			0470	There is an increase in intensity of 40% or more when compared against "SGNL - D" read during initial setting.

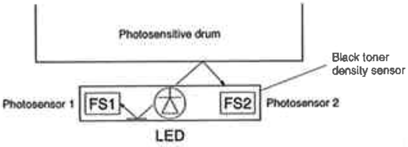


Figure 3-540

d. Bk Toner Density Control Flow and Relate Detailed Codes during Copying Operation

Initial setting flow	Operation	Related detailed code	Error detection
1. Copy Start key on (starts initial rotation)			
2. Checking the connector for disconnection		0400	The connector is disconnected.
3. Checks soiling on the window (during initial rotation.	Same as at power - on.	0460	Same as at power - on.
		0470	Same as at power - on.
4. Forms a Bk halftone patch on the photosensitive drum.	Forms a patch opposite the joint plate of the transfer drum.		
5. Measures the density 5.1 [REF - K] "SGNL - K".	Turns on the LED of the Bk toner density sensor to expose the photosensitive drum; the reflected light is received by the Photosensor 1, and its intensity is measured and converted to a voltage. Each sampling consists of 10 measurements, and a single sampling is taken.	04A1	The variation of "REF - K" within a single sampling is 102 or more.
5.2 Makes comparisons and computations.	Compares "REF - K" read in 5.1 and "REF - K" read during initial setting and stored in memory.	04B1	"REF - K" read in 5.1 is lower than "REF - K" read in initial setting by 30% or more.
		04B1	"REF - K" read in 5.1 is higher than "REF - K" read in initial setting by 30%.
		0481	"REF - K" stored in memory is 777 or less.
		0491	"REF - K" stored in memory is 859 or more.
5.3 Read "SGNL - K".	Turns on the LED in the Bk toner density sensor, and the light reflected by the patch on the photosensitive drum is measured by the photosensor 2 and converted into voltage. Takes a single sampling consisting of 10 measurements.	04A0	The variation in settings of "SGNL - K" within a single sampling is 102 or more.
		04B0	The setting of "SGNL - K" read is 102 or less.
		04C0	The setting of "SGNL - K" read is 550 or more.

Initial setting flow		Operation	Related detailed code	Error detection
5. Measures the density	5.4 Makes comparisons and computations.	Compares "SGNL - K" read in 3.1 against "SGNL - K" read in initial setting and stored in memory to identify the density of toner inside the developing assembly.	0480	The setting of "SGNL - K" stored in memory is 163 or less.
			0490	The setting of "SGNL - K" stored in memory is 470 or more.
			04D0	A setting for "SGNL - K" which is –3.0% or less in relation on "SGNL - K" stored in memory has been detected 20 times or more continuously.
			04E0	A setting for "SGNL - K" which is +3.0% or more in relation to "SGNL - K" stored in memory has been detected 20 times or more continuously.

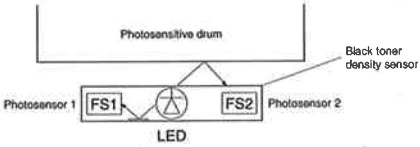

Photosensitive drum
Black toner density sensor
Photosensor 1
FS1
FS2
Photosensor 2
LED

Figure 3-541

e. M/C/Y Toner Density Control Flow and Related Detailed Codes during Copying Operation
XX indicates the color of the developing assembly (toner). xx = 01: M, xx = 02: C, xx = 03: Y

Initial setting flow		Operation	Related detailed code	Error detection
1. Copy Start key on (starts initial rotation).				
2. Checking the connector for disconnection.			xx00	The connector is disconnected.
3. Measures the density	3.1 Reads "REF - M/C/Y".	The LED of each toner sensor is turned on, and its direct light is detected by the photosensor 1 and converted into voltage. As many as 10 measurements are grouped as one sampling. (During this period, a single sampling is executed.)	xxA1	The variation in settings of "REF - M/C/Y" within a single sampling is 102 or more.
	3.2 Makes comparisons and computations.	Compares "REF - M/C/Y" read in 3.1 against "REF - M/C/Y" read in initial setting and stored in memory.	xxB1	The setting of "REF - M/C/Y" read in 3.1 is lower than the setting of "REF - M/C/Y" read in initial setting by 30% or more.
			xxC1	The setting of "REF - M/C/Y" read in 3.1 is higher than the setting of "REF - M/C/Y" read in initial setting by 30% or more.
			xx81	The setting of "REF - M/C/Y" stored in memory is 144 or less.
			xx91	The setting of "REF - M/C/Y" stored in memory is 920 or more.
	3.3 Reads "SGNL - M/C/Y".	Turns on the LED in each toner density sensor, the reflected light is received by the photosensor 2, and the intensity is measured and converted into voltage. Takes a single sampling consisting of 10 measurements.	xxA0	The variation in settings of "SGNL - M/C/Y" within a single sampling is 102 or more.
			xxB0	The setting of "SGNL - M/C/Y" read is 306 or less.
			xxC0	The setting of "SGNL - M/C/Y" read is 1013 or more.
	3.4 Makes comparisons and computations.	Compares "SGNL - M/C/Y" read in 3.3 against "SGNL -M/C/Y" read in initial setting and stored in memory to identify the density of toner inside the developing assembly.	xx80	The setting of "SGNL - M/C/Y" stored in memory is 777 or less.
			xx90	The setting of "SGNL - M/C/Y" stored in memory is 859 or more.
			xxD0	A setting for "SGNL - M/C/Y" which is –3.0% or less in relation to "SGNL - M/C/Y" stored in memory has been detected 20 times or more continuously.
			xxE0	A setting for "SGNL - M/C/Y" which is +3.0% or less in relation to "SGNL - M/C/Y" stored in memory has been identified 20 times or more continuously.

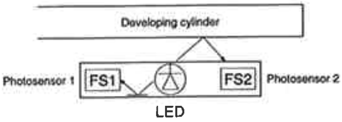


Figure 3-542

6. Supplying Toner

The copier has four hoppers, each for M, C, Y, and Bk. Figure 3-543 is a cross section of the C hopper.

If the density of toner inside any of the developing assembly is below the specified value, the toner supply clutch for that developing assembly turns on.

The activation of the toner supply clutch causes the drive of the main motor (M4) to be transmitted to the feeding screw, thereby supplying the developing assembly with toner.

This supply operation is executed when the developing assembly is at the point of development.

The period during which the clutch remains on differs depending on the toner supply amount determined by the toner density detecting circuit.

Each hopper is equipped with a toner sensor (piezoelectric oscillator); when the toner falls below a specific level, the ADD TONER message is indicated on the control panel after finishing the ongoing copying cycle.

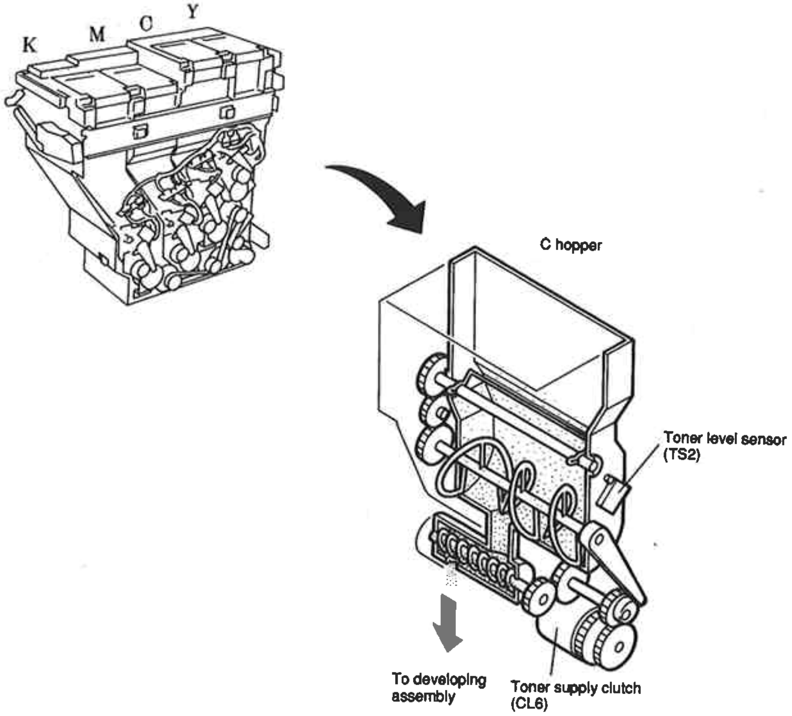


Figure 3-543

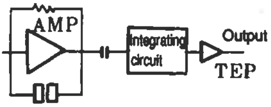
Table 3-505 shows the toner supply clutch and toner sensor intended for each developing assembly.

	M	C	Y	Bk
Toner supply clutch	CL5	CL6	CL7	CL8
Toner level sensor	TS1	TS2	TS3	TS4

Table 3-505

Reference:

The detecting unit of the toner sensor used in the hopper is a piezoelectric oscillator; it oscillates at several kHz in the absence of toner, causing the sensor output to be Low. In the presence of toner, the oscillation stops, causing the sensor output to be high.



Piezoelectric oscillator

Figure 3-544

6. Photosensitive Drum Cleaning

a. Waste Toner Detection

The photosensitive drum cleaner is driven by the main motor (M4); the waste toner that has been scraped by the cleaning blade is forwarded to the waste toner container by a feeding screw for collection.

The level of waste toner is monitored by a waste toner sensor of a transmission type; when the level exceeds the specified level, the copier indicates the WASTE TONER message on the control panel.

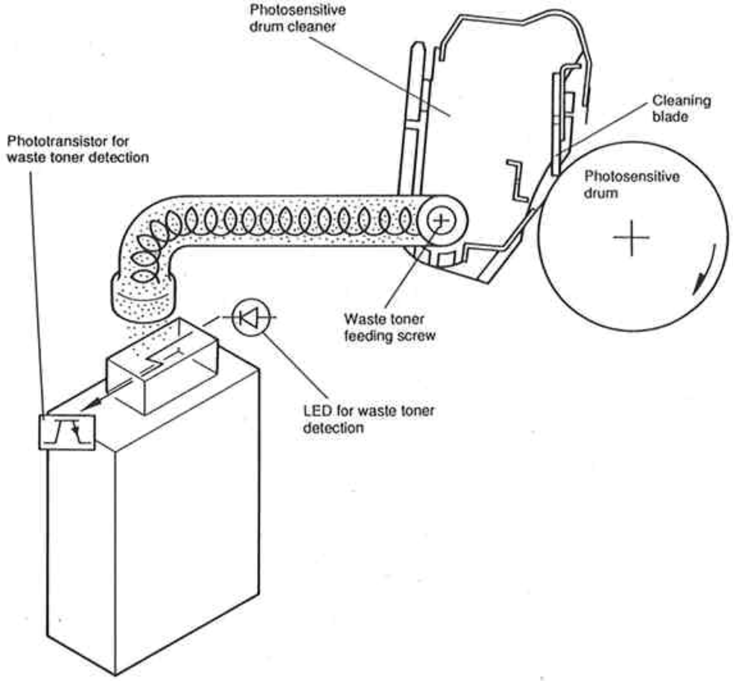

Photosensitive drum cleaner
Cleaning blade
Phototransistor for waste toner detection
Photosensitive drum
Waste toner feeding screw
LED for waste toner detection

Figure 3-545

b. Waste Toner Feeding Screw Locking Detection

If, for some reason, the waste toner pipe becomes clogged with waste toner and, as a result, the feeding screw fails to rotate, waste toner could start to leak because of a feeding fault.

To prevent such a problem, the copier is equipped with a feeding screw locking detection mechanism.

If the feeding screw becomes locked, the gear A (Figure 3-546) used to drive the waste toner feeding screw receives escape force in the axial direction, moving along the axis.

The movement of the gear A is checked by the waste toner feed screw lock detection switch (MS4).

When the MS4 is pushed by the gear A, the main motor (M4) stops, and the copier indicates 'E013' on the control panel.

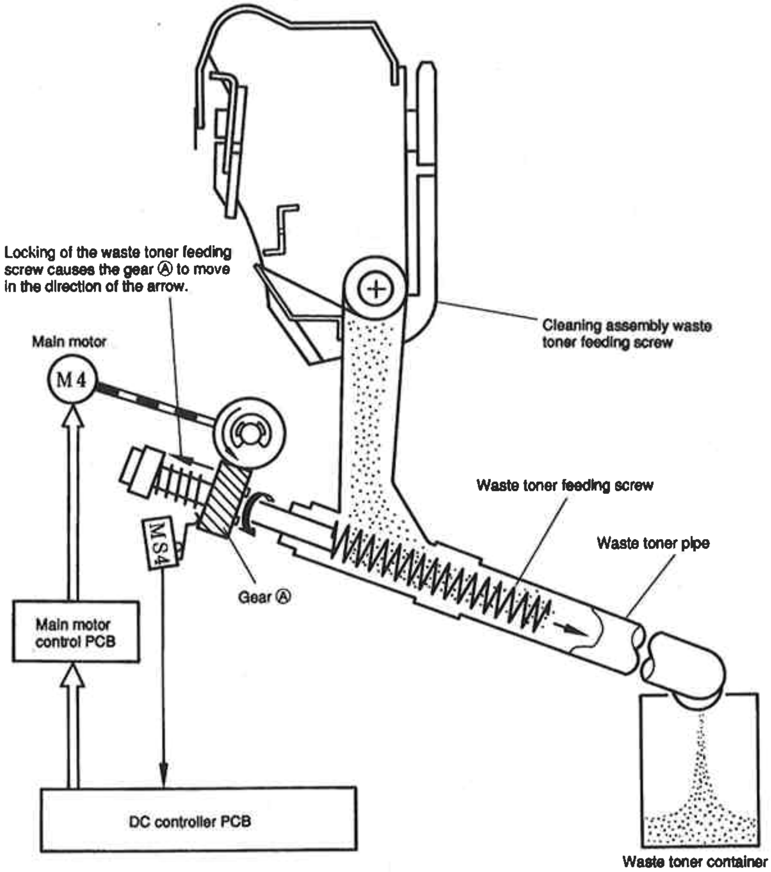

Locking of the waste toner feeding screw causes the gear Ⓐ to move in the direction of the arrow.
Main motor
M4
MS4
Gear Ⓐ
Main motor control PCB
DC controller PCB
Cleaning assembly waste toner feeding screw
Waste toner feeding screw
Waste toner pipe
Waste toner container

Figure 3-546

VI. PICK-UP/FEEDING SYSTEM

A. Outline

The copier uses the center reference feeding system, in which copy paper moves through the center of the pick-up feeding path.

The pick-up system of the CLC800 consists of cassette 1 (small size), duplexing unit, cassette 3, cassette 4 (large size), and multifeeder.

The pick-up system of the CLC700, on the other hand, consists of cassette 1 (small size), cassette 2 (large size), and multifeeder.

Copy paper picked up from a cassette or the multifeeder is moved to the registration roller.

When the registration roller has rotated, the retention roller becomes engaged and the retention corona assembly turns on to wrap the copy paper around the transfer drum.

In this condition, the toner image on the photosensitive drum is transferred to the copy paper; the transfer drum rotates a maximum of four times with copy paper wrapped around it.

If the copy paper is of a small size (182 to 216 mm), two sheets are kept on the transfer drum at a time to increase the copying speed.

When transfer is over, the copy paper is moved through the separation, feeding, and fixing assemblies before delivery to the copy tray.

Figure 3-601 and -602 are outline diagrams of the feeding paths of the CLC800 and CLC700.

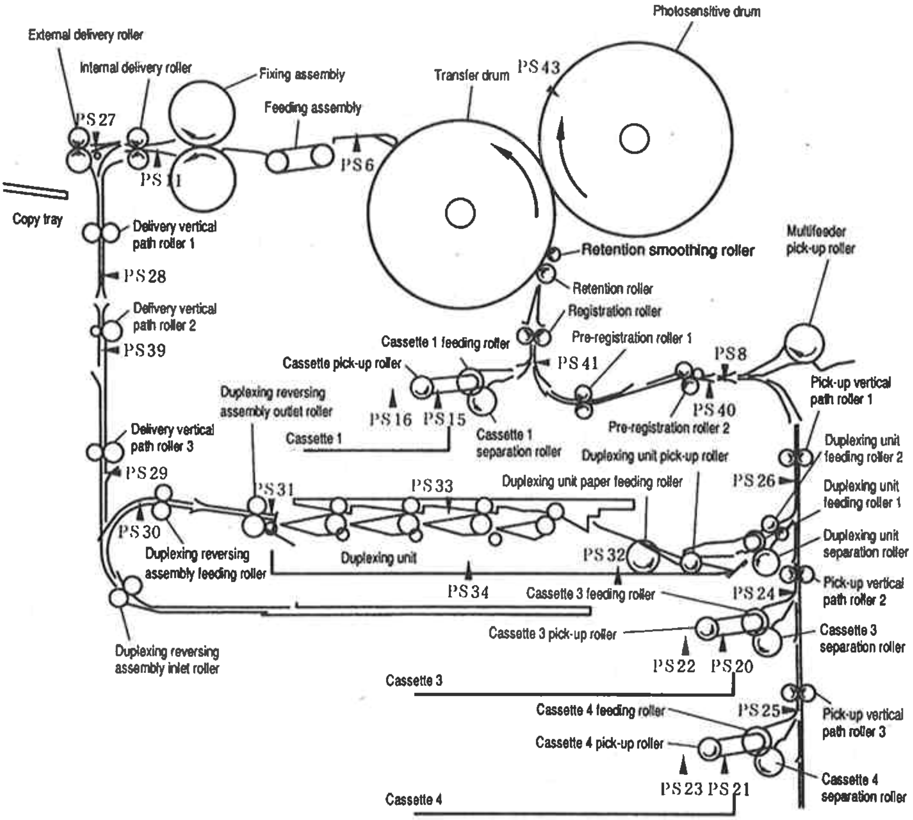

Photosensitive drum
External delivery roller
Internal delivery roller
Fixing assembly
Transfer drum
PS43
Feeding assembly
PS27
PS11
PS6
Copy tray
Delivery vertical path roller 1
Retention smoothing roller
Multifeeder pick-up roller
PS28
Retention roller
Delivery vertical path roller 2
Registration roller
PS39
Cassette 1 feeding roller
Pre-registration roller 1
PS8
Cassette pick-up roller
PS41
Duplexing reversing assembly outlet roller
Pick-up vertical path roller 1
PS16
PS15
PS40
Delivery vertical path roller 3
Cassette 1
Cassette 1 separation roller
Pre-registration roller 2
Duplexing unit pick-up roller
Duplexing unit feeding roller 2
PS29
PS31
PS33
Duplexing unit paper feeding roller
PS26
Duplexing unit feeding roller 1
PS30
Duplexing reversing assembly feeding roller
Duplexing unit
PS32
Duplexing unit separation roller
PS34
Cassette 3 feeding roller
PS24
Pick-up vertical path roller 2
Cassette 3 pick-up roller
Cassette 3 separation roller
Duplexing reversing assembly inlet roller
PS22
PS20
Cassette 3
Cassette 4 feeding roller
PS25
Pick-up vertical path roller 3
Cassette 4 pick-up roller
PS23
PS21
Cassette 4 separation roller
Cassette 4

Figure 3-601 CLC800

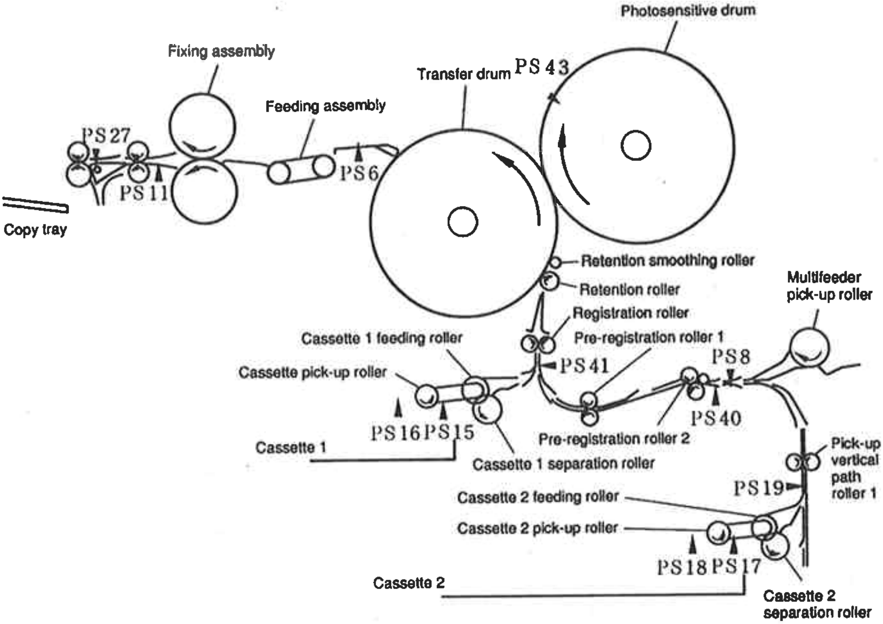

Photosensitive drum
Fixing assembly
Transfer drum
PS 43
Feeding assembly
PS 27
PS 11
PS 6
Copy tray
Retention smoothing roller
Retention roller
Multifeeder pick-up roller
Registration roller
Cassette 1 feeding roller
Pre-registration roller 1
PS 8
Cassette pick-up roller
PS 41
PS 40
PS 16
PS 15
Pre-registration roller 2
Cassette 1
Cassette 1 separation roller
Pick-up vertical path roller 1
PS 19
Cassette 2 feeding roller
Cassette 2 pick-up roller
PS 18
PS 17
Cassette 2
Cassette 2 separation roller

Figure 3-602 CLC700

Notation	Name
PS8	Multifeeder pick-up sensor
PS11	Internal delivery sensor
PS14	Multifeeder paper sensor
PS15	Cassette 1 lifter sensor
PS16	Cassette 1 paper sensor
PS17 (CLC700)	Cassette 2 lifter sensor
PS18 (CLC700)	Cassette 2 paper sensor
PS19 (CLC700)	Pick-up vertical path 1A sensor
PS20 (CLC800)	Cassette 3 lifter sensor
PS21 (CLC800)	Cassette 4 lifter sensor
PS22 (CLC800)	Cassette 3 paper sensor
PS23 (CLC800)	Cassette 4 paper sensor
PS24 (CLC800)	Pick-up vertical path 2 sensor
PS25 (CLC800)	Pick-up vertical path 3 sensor
PS26 (CLC800)	Pick-up vertical path 1B sensor
PS27	External delivery sensor
PS28 (CLC800)	Delivery vertical path 1 sensor
PS29 (CLC800)	Duplexing pre-reversal paper sensor
PS30 (CLC800)	Duplexing post-reversal paper sensor
PS31 (CLC800)	Duplexing reversing unit outlet sensor
PS32 (CLC800)	Duplexing stacking assembly paper sensor
PS33 (CLC800)	Duplexing feeding assembly paper sensor
PS34 (CLC800)	Paper jogging guide home positions sensor
PS39 (CLC800)	Delivery vertical path 2 sensor
PS40	OHP sensor
PS41	Registration paper sensor
PS43	Pre-photosensitive drum cleanner paper sensor

Table 3-601

B. Pick-Up Assembly

1. Identifying the Size of Copy Paper

a. Outline

The size of the copy paper inside the cassette is checked by the paper size sensor attached to the rear of the cassette holder.

When a cassette is inserted into a cassette holder, the paper size sensors are pushed by the bosses on the cassette, enabling identification of the width and length of the paper. The copier identifies the size of the paper size based on the combination of width and length of the paper and, at the same time, determines when the scanner must be reversed and how the laser exposure range must be controlled.

The bosses on the cassette used to push the paper size operate in conjunction with the guide plate inside the cassette; changing the location of the guide plate to suit the paper size automatically determines the paper size identified by the copier. (See Figure 3-604.)

b. Identifying the Size of Copy Paper

The copy paper length sensor consists of two photointerrupters; the combination of the outputs of these two sensors makes identification of the length of paper possible.

On the other hand, the copy paper width sensor is a variable resistor, whose output resistance enables identification of the width of paper.

Figure 3-603 shows the relationship between paper widths and outputs of the variable resistor. The proportional relationship shown in the graph is stored in RAM on the DC controller PCB.

You must store the initial settings at the time you initialize the RAM on the DC controller whenever you have replaced the cassette, sensor, or DC controller. (See p. 3-278.)

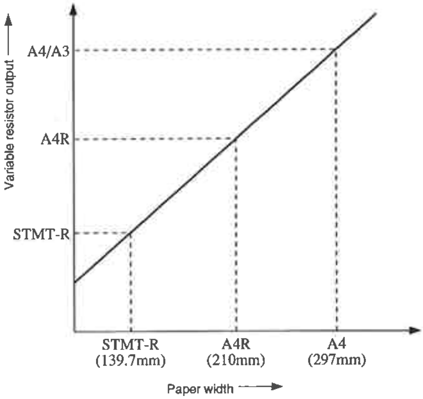
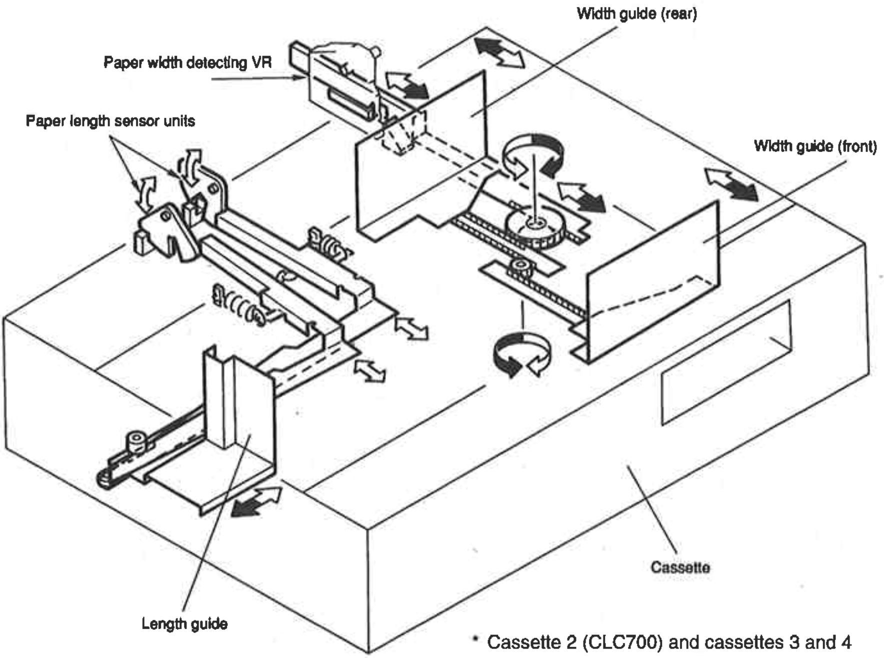


Figure 3-603


Width guide (rear)
Paper width detecting VR
Paper length sensor units
Width guide (front)
Cassette
Length guide

* Cassette 2 (CLC700) and cassettes 3 and 4 (CLC800) only.
Cassette 1 accommodates only a specific size of paper, and is not equipped with a paper length sensor unit.

Figure 3-604

c. Marking on the Width Guide Rail

The width guide rail found inside the cassette has holes used to determine paper size positions, and holes are identified with markings (A through M); see Table 3-602.

You may make use of these markings when making sure that the width guides are properly installed to suit the copy paper width in response to a call from the user noting skew movements of copy paper. (The markings are not made known to the user.)

Markings	Paper	Remarks
A	STMT-R	
B	A5-R	
C	B5-R	
D	KLGL-R	
E	GLTR-R	
F	G-LGL	G3
G	A4-R	
H	LGL/LTR-R	
I	FLSC	G2
J	B4/B5	
K	G-LTR	G1
L	11″ × 17″/LTR	G5
M	A3/A4	

(For G1 through G5, see Table 3-604.)

Table 3-602

d. Paper Size

The microprocessor on the DC controller determines the size of copy paper based on paper width/length input.

Paper length sensor / Paper width sensor slice level (in mm)	PS101 PS103 PS105	PS102 PS104 PS106	PS101 PS103 PS105	PS102 PS104 PS106	PS101 PS103 PS105	PS102 PS104 PS106	PS101 PS103 PS105	PS102 PS104 PS106
Signal	SZ0	SZ1	SZ0	SZ1	SZ0	SZ1	SZ0	SZ1
ON/OFF	0	0	0	1	1	0	1	1
288.5	A4		—		A3		—	
273.7	(G5)		—		11″ × 17″		—	
261.8	(G1)		—		—		—	
238.0	B5		—		B4		—	
212.9	STMT		LTRR		LGL		(G2)	
206.6	A5		A4R		—		(G3)	
196.6	G-LTRR		—		—			
186.0	K-LGLR		—		—		—	
165.2	B5R		—		—		—	
144.1	A5R		—		—		—	
	STMTR		—		—		—	

Table 3-603

The sizes shown in Table 3-604 are specified in service mode for each group of paper sizes.

The asterisk (*) indicates the size specified at the factory.

Group	Size	
G1	*	G-LTR
		K-LGL
G2	*	FOOLSCAP
		OFFICIO
		E-OFFI
		A-LGL
		A-OFFI
G3	*	G-LGL
		FOLIO
		AUS-FLS
G5	*	LTR
		A-LTR

Table 3-604

e. Paper Sizes

Table 3-605 shows the sizes of copy paper that may be used in the CLC700 and CLC800.

The CLC700 uses cassette 1 (small size) and cassette 2 (large size).

The CLC800 uses cassette 1 (small size), duplexing unit, cassette 3, and cassette 4 (large size).

You may place only A4 or LTR paper in the small size cassette.

You may place all paper that may be accommodated by the copier in the large size cassette and multifeeder tray.

You may place transparency in any cassette, but you may place postcard (special), label sheet (special), or thick paper (106 to 163 g/m²) only in the multifeeder.

Paper	Notation	Size (vertical × horizontal; in mm)
A3	A3	(297±1) × (420±1)
A4R	A4R	(210±1) × (297±1)
A4	A4	(297±1) × (210±1)
B4	B4	(257±1) × (364±1)
B5R	B5R	(182±1) × (257±1)
B5	B5	(257±1) × (182±1)
11″ × 17″	11×17	(279±1) × (432±1)
LETTER R	LTRR	(216±1) × (279±1)
LETTER	LTR	(279±1) × (216±1)
LEGAL	LGL	(216±1) × (356±1)

Table 3-605

f. Storing Paper Width Default Settings

See p. 3-278

2. Cassette Pick-Up Assembly

a. Operation

The pick-up assembly of the CLC800 and CLC700 has a construction shown in Figure 3-605 and -606.

The cassette is capable of accommodating as many as 500 sheets of copy paper (80 g/m²).

The copy paper inside the cassette is lifted by the lifter, whereupon it comes into contact with the pick-up roller.

When the pick-up clutch turns on, the pick-up roller rotates to forward the copy paper; then, the pick-up roller solenoid turns on, and the pick-up roller moves away from the paper.

The paper then moves past the pick-up vertical path roller and pre-registration roller until it reaches the transfer drum by way of the registration roller.

See Table 3-606 for the notations of the pick-up clutch and pick-up roller solenoid of each of the cassettes used in the CLC800 and CLC700.

Cassette / Name	Multifeeder	Cassette 1	Cassette 2 (CLC700)	Cassette 3 (CLC800)	Cassette 4 (CLC800)	Duplexing unit (CLC800)
Pick-up clutch	CL12	CL13	CL14	CL16	CL17	CL19
Pick-up roller solenoid	SL15	SL16	SL17	SL18	SL19	SL21

Table 3-606

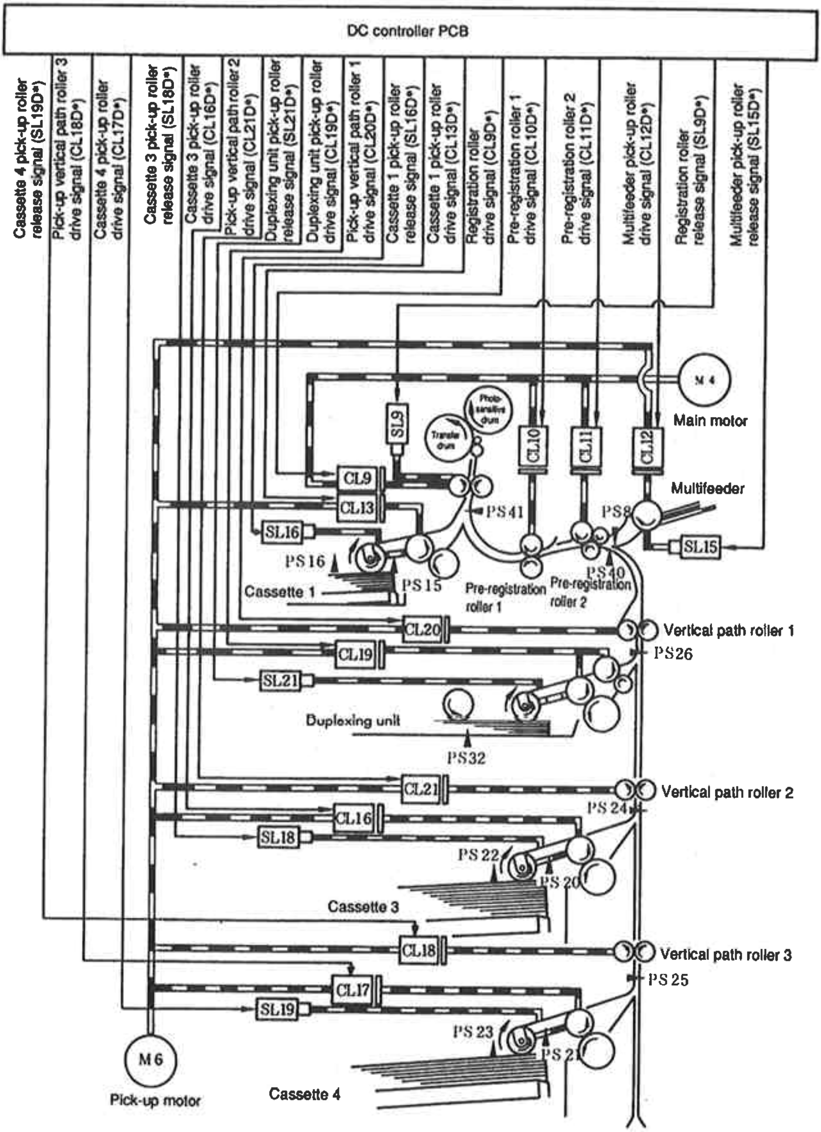

DC controller PCB
Cassette 4 pick-up roller release signal (SL19D*)
Pick-up vertical path roller 3 drive signal (CL18D*)
Cassette 4 pick-up roller drive signal (CL17D*)
Cassette 3 pick-up roller release signal (SL18D*)
Cassette 3 pick-up roller drive signal (CL16D*)
Pick-up vertical path roller 2 drive signal (CL21D*)
Duplexing unit pick-up roller release signal (SL21D*)
Duplexing unit pick-up roller drive signal (CL19D*)
Pick-up vertical path roller 1 drive signal (CL20D*)
Cassette 1 pick-up roller release signal (SL16D*)
Cassette 1 pick-up roller drive signal (CL13D*)
Registration roller drive signal (CL9D*)
Pre-registration roller 1 drive signal (CL10D*)
Pre-registration roller 2 drive signal (CL11D*)
Multifeeder pick-up roller drive signal (CL12D*)
Registration roller release signal (SL9D*)
Multifeeder pick-up roller release signal (SL15D*)
M 4
Main motor
Photo-sensitive drum
Transfer drum
SL9
CL10
CL11
CL12
CL9
CL13
Multifeeder
PS41
PS8
SL16
SL15
PS16
PS15
Cassette 1
Pre-registration roller 1
Pre-registration roller 2
PS40
CL20
Vertical path roller 1
PS26
CL19
SL21
Duplexing unit
PS32
CL21
Vertical path roller 2
PS24
CL16
SL18
PS22
PS20
Cassette 3
CL18
Vertical path roller 3
PS25
CL17
SL19
PS23
PS21
M 6
Pick-up motor
Cassette 4

Figure 3-605 CLC800 Pick-Up Assembly

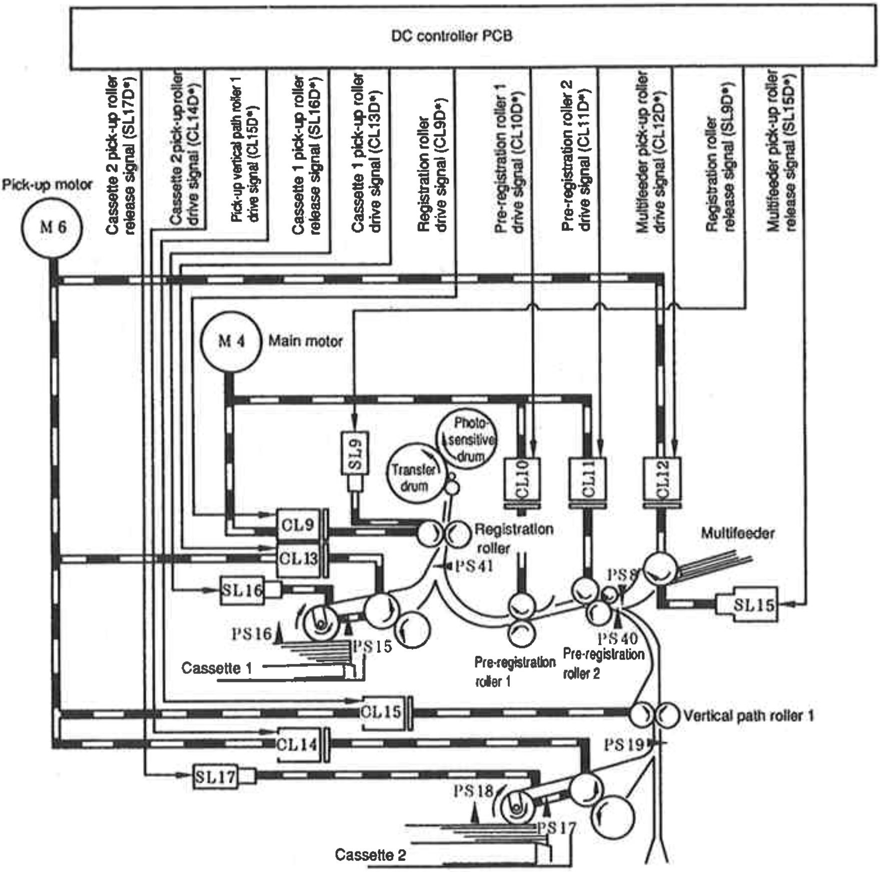

DC controller PCB
Cassette 2 pick-up roller release signal (SL17D*)
Cassette 2 pick-up roller drive signal (CL14D*)
Pick-up vertical path roller 1 drive signal (CL15D*)
Cassette 1 pick-up roller release signal (SL16D*)
Cassette 1 pick-up roller drive signal (CL13D*)
Registration roller drive signal (CL9D*)
Pre-registration roller 1 drive signal (CL10D*)
Pre-registration roller 2 drive signal (CL11D*)
Multifeeder pick-up roller drive signal (CL12D*)
Registration roller release signal (SL9D*)
Multifeeder pick-up roller release signal (SL15D*)
Pick-up motor
M 6
M 4
Main motor
SL9
Photo-sensitive drum
Transfer drum
CL10
CL11
CL12
CL9
CL13
Registration roller
PS41
Multifeeder
PS8
SL16
SL15
PS16
PS15
Cassette 1
PS40
Pre-registration roller 1
Pre-registration roller 2
CL15
Vertical path roller 1
CL14
PS19
SL17
PS18
PS17
Cassette 2

Figure 3-606 CLC700 Pick-Up Assembly

b. Cassette Lifter Operation

Figures 3-607 and -608 are outline diagrams of the cassette lifter operation.

When the cassette is inserted into the copier, the pick-up roller lowers, and the light-blocking plate leaves the lifter position sensor.

This condition causes the lifter motor to turn on, raising the lifter; then, the lifter motor stops where the lifter position sensor can detect the face of the stack of copy paper on the lifter.

When copy paper runs out and the paper detecting lever leaves the paper sensor, the copier indicates the Add Paper message on the control panel.

Table 3-607 shows the notations used for the lifter motor, lifter position sensor, and paper sensor as used for each of the cassettes in the copier.

Cassette / Notation	Cassette 1	Cassette 2 (CLC700)*	Cassette 3 (CLC800)	Cassette 4 (CLC800)
Lifter motor	M12	M13	M14	M15
Lifter position sensor	PS15	PS17	PS20	PS21
Paper sensor	PS16	PS18	PS22	PS23

*For the duplexing unit (CLC800), see p. 3-134.

Table 3-607

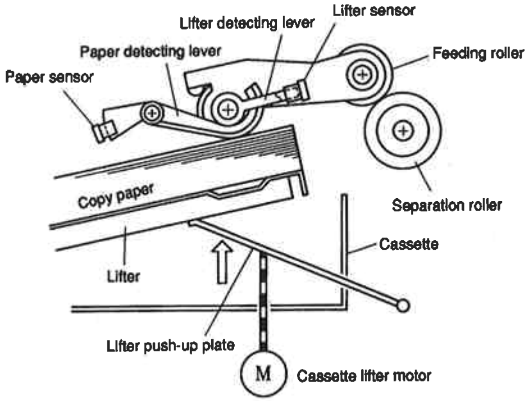

Lifter sensor
Lifter detecting lever
Paper detecting lever
Feeding roller
Paper sensor
Copy paper
Separation roller
Cassette
Lifter
Lifter push-up plate
M
Cassette lifter motor

Figure 3-607

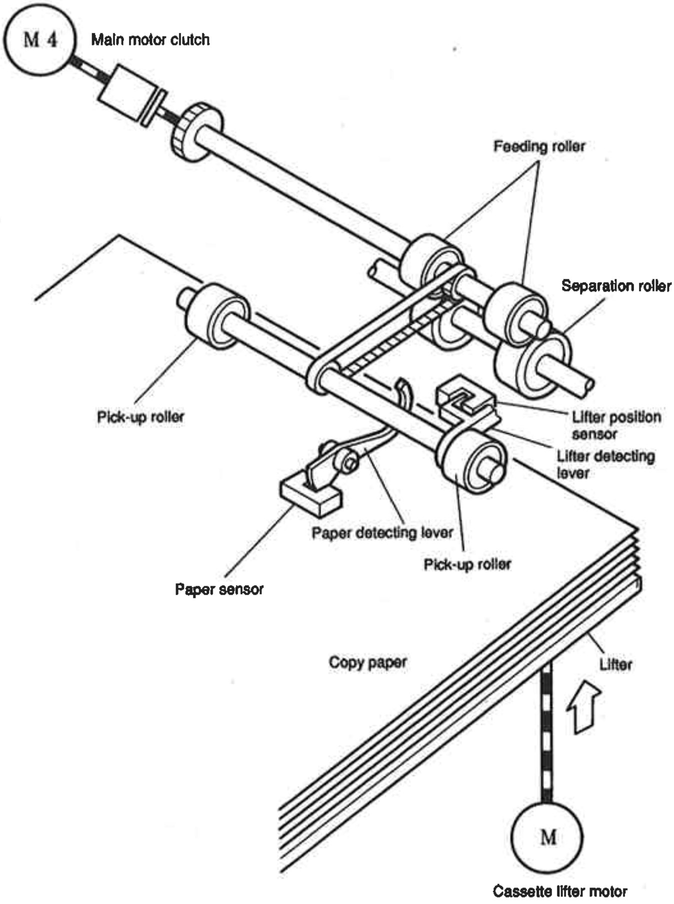

M 4
Main motor clutch
Feeding roller
Separation roller
Pick-up roller
Lifter position sensor
Lifter detecting lever
Paper detecting lever
Pick-up roller
Paper sensor
Copy paper
Lifter
M
Cassette lifter motor

Figure 3-608

c. Sequence of Pick-Up Operations

① Cassette 1, A4, 2 Copies Continuous, 4-Color, DIRECT

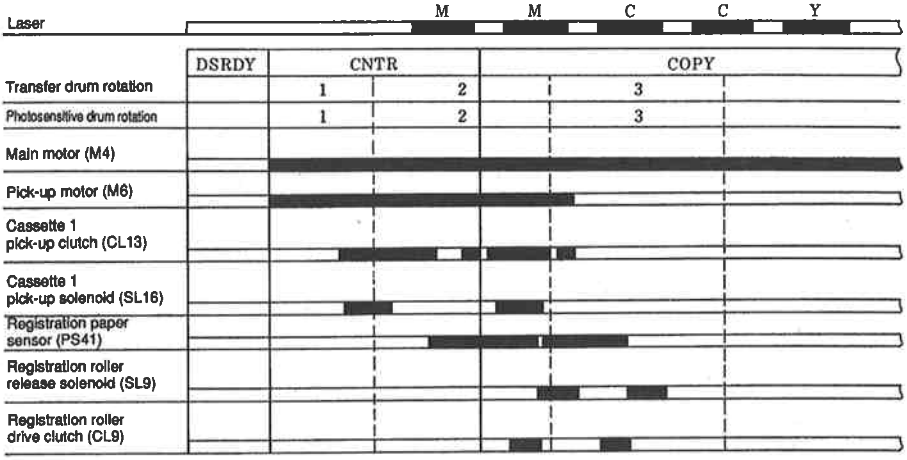


Figure 3-609

② Cassette 3, A4, 2 Copies Continuous, 4-Color, DIRECT

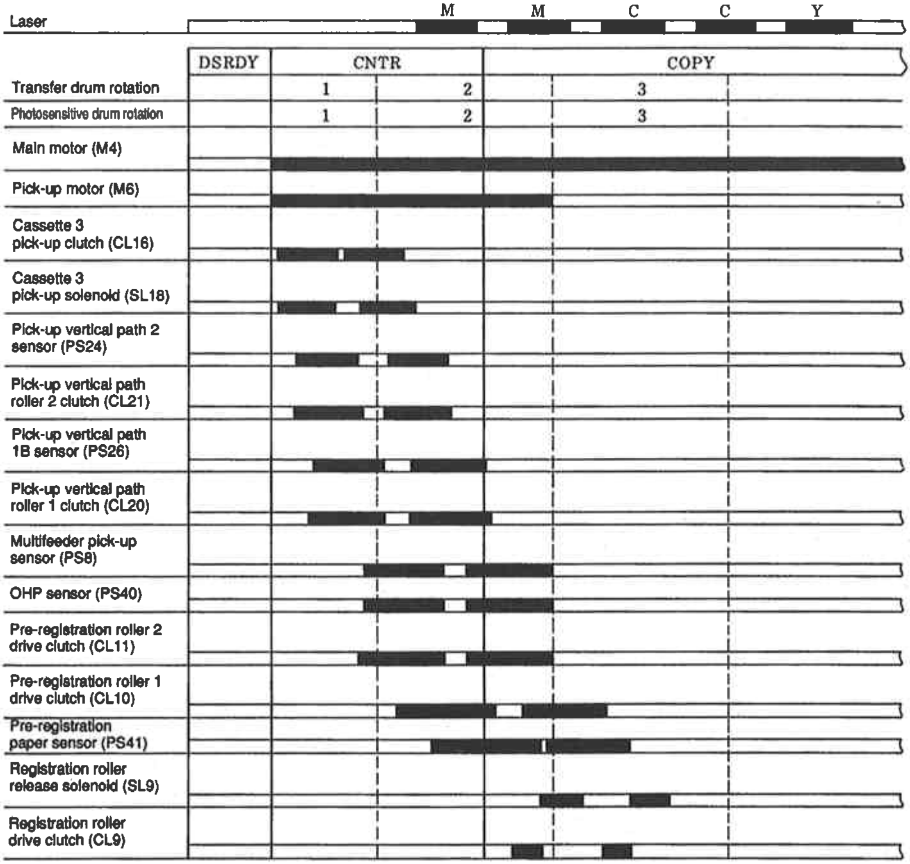


Figure 3-610

3. Multifeeder Pick-Up Assembly

a. Operation

The multifeeder pick-up assembly is constructed as shown in Figure 3-611.

The multifeeder is designed so that paper is picked up from its tray and is also capable of accommodating continuous feeding.

As many as 50 sheets of copy paper (80 g/m²) may be stacked on its tray.

The presence of copy paper on the tray is checked by the multifeeder paper sensor (PS14).

The copy paper stacked on the tray is butted against the pick-up roller by the paper guide plate. The pick-up roller starts to rotate when the drive of the pick-up motor (M6) is transmitted through a clutch.

Only one sheet of copy paper is forwarded by the work of the pick-up roller and the separation pad to the registration roller through the pre-registration roller.

The above series of operations is repeated for each pick-up.

Thick paper fed through the multifeeder is identified when the user select 'Thick Paper' on the touch panel.

For transparencies, see p. 3-133.

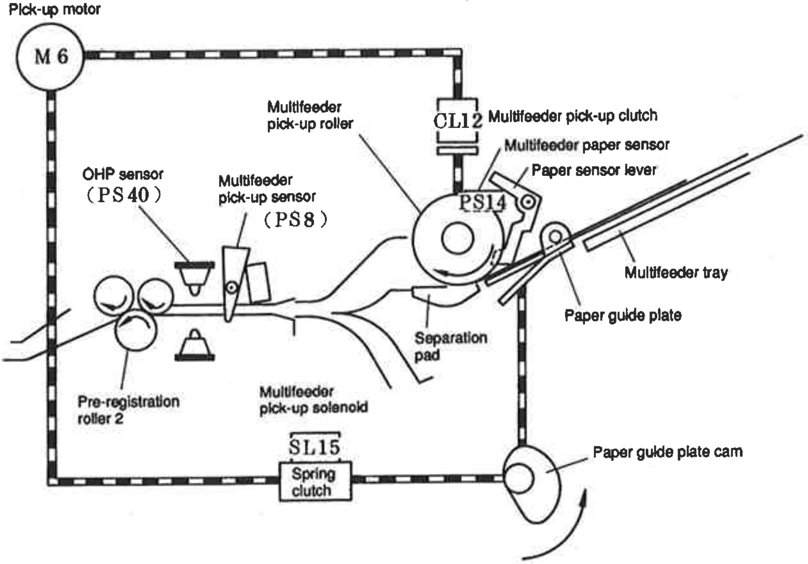

Pick-up motor
M 6
Multifeeder pick-up roller
CL12
Multifeeder pick-up clutch
Multifeeder paper sensor
Paper sensor lever
OHP sensor
(PS40)
Multifeeder pick-up sensor
(PS8)
PS14
Multifeeder tray
Paper guide plate
Separation pad
Pre-registration roller 2
Multifeeder pick-up solenoid
SL15
Spring clutch
Paper guide plate cam

Figure 3-611

b. Identifying the Size of Copy Paper in the Multifeeder

The paper width guide plate of the copier's multifeeder tray is equipped with a variable resistor; the width of paper is identified when the guide plate is butted against the edge of the stack of copy paper. (See Figure 3-612.)

In addition, the length of copy paper in manual mode is identified by the period of time during which the multifeeder pick-up sensor (PS8) remains on.

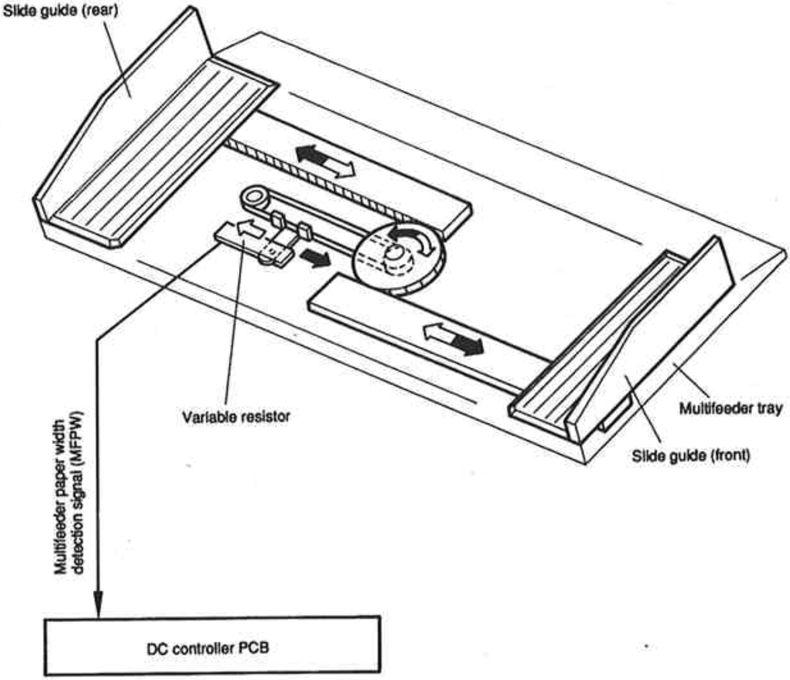

Slide guide (rear)
Variable resistor
Multifeeder tray
Slide guide (front)
Multifeeder paper width detection signal (MFPW)
DC controller PCB

Figure 3-612

c. Sequence of Pick-Up Operations

Multifeeder, A4, 4-Color, DIRCT

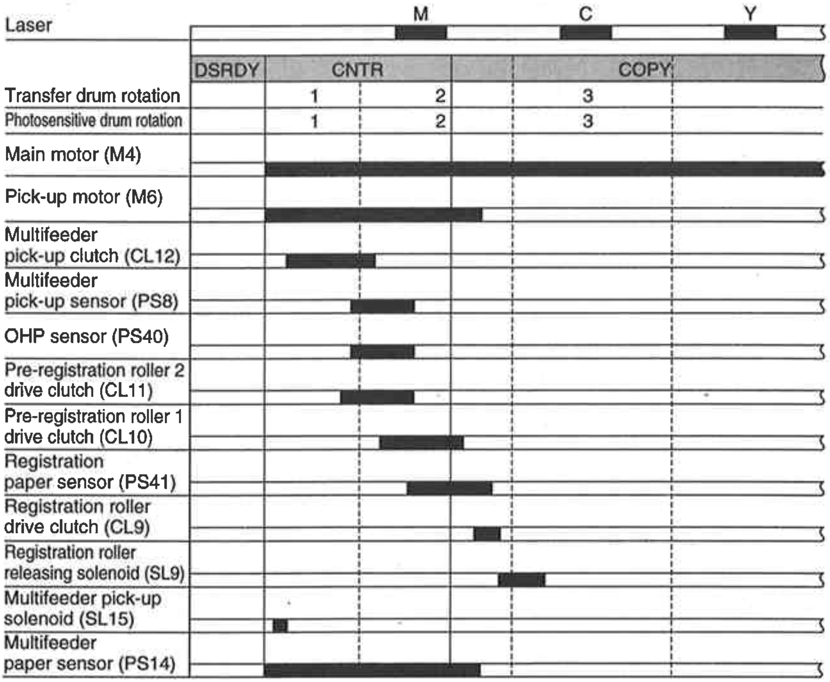


Figure 3-613

4. OHP Film Pick-Up

Like plain paper, you can place transparencies in the multifeeder, cassette 1, cassette 2, cassette 3, or cassette 4.

If transparencies are set in the multifeeder, cassette 2, cassette 3, or cassette 4, the OHP sensor (PS40) identifies whether the material is transparencies or otherwise.

If transparencies are stacked in cassette 1, the registration paper sensor (PS41) is used to identify whether the paper is a transparency or otherwise.

If the copier identifies the material as transparencies, it switches the speed of the fixing assembly.

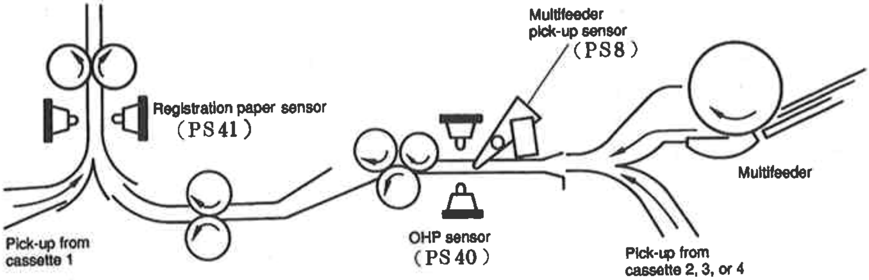

Multifeeder
pick-up sensor
(PS8)
Registration paper sensor
(PS41)
Multifeeder
Pick-up from
cassette 1
OHP sensor
(PS40)
Pick-up from
cassette 2, 3, or 4

Figure 3-614

Reference:

1. Advise the user to place one sheet of thick paper (to serve as backing paper) inside the cassette before stacking transparencies.
2. Advise the user to separate each transparency before stacking them in the cassette or the multifeeder.

C. Duplexing Unit

1. Outline

After the fixing process, copy paper picked up from the cassette or multifeeder is forwarded to the delivery vertical path assembly by the delivery paper deflecting plate; then, it is moved to the duplexing feeding assembly located inside the duplexing unit.

In the duplexing feeding assembly, the four paper deflecting plates form an appropriate path according to the length of the paper, and the paper is moved farther to the duplexing stacking assembly.

In addition, a duplexing stacking assembly heater is provided to prevent curling of copy paper.

Figures 3-615 and -616 show outline diagrams of the duplexing unit and its basic operations.

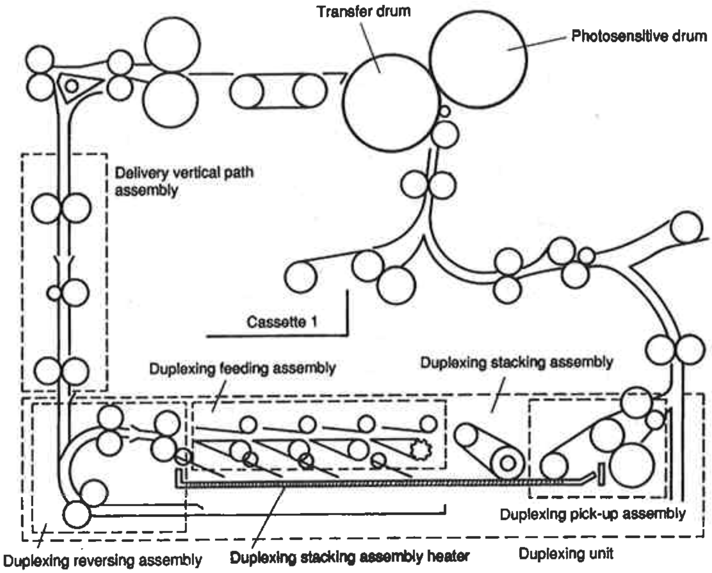

Transfer drum
Photosensitive drum
Delivery vertical path assembly
Cassette 1
Duplexing feeding assembly
Duplexing stacking assembly
Duplexing pick-up assembly
Duplexing reversing assembly
Duplexing stacking assembly heater
Duplexing unit

Figure 3-615

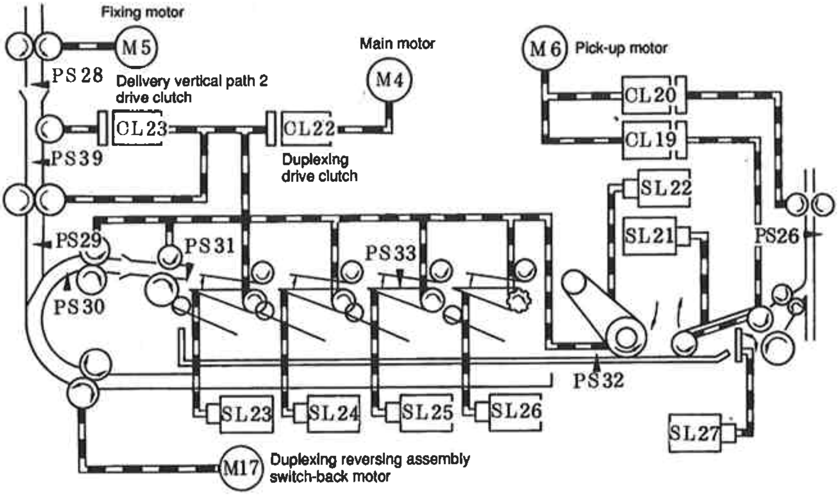

Fixing motor
M5
Main motor
M4
M6
Pick-up motor
PS28
Delivery vertical path 2 drive clutch
CL23
CL22
Duplexing drive clutch
CL20
CL19
PS39
SL22
SL21
PS29
PS31
PS33
PS26
PS30
PS32
SL23
SL24
SL25
SL26
SL27
M17
Duplexing reversing assembly switch-back motor

Figure 3-616

2. Stacking Two-Sided Copies

When making one two-sided copy, the copier's delivery deflecting plate shifts up to move paper as far as the duplexing reversing assembly.

Then, when the reversing roller rotates in reverse, the path formed by the deflecting sheet carries the copy paper to the duplexing unit feeding assembly, thereby reversing the copy paper.

The pick-up roller inside the duplexing unit rises, and the stopper plate shifts up, waiting for the copy paper.

When the copy paper reaches inside the duplexing unit stacking assembly, the feeding roller lowers to butt the copy paper against the stopper plate.

At this time, the copy paper is held in place by the pick-up roller; moreover, the curl pressing sheet or the curl pressing roller keeps the curl on the trailing edge of the copy paper down; see sections d and e.

When the last copy paper is stacked, the stopper plate shifts down, and the pick-up roller starts pick-up operation.

Figures 3-617 and -618 are outline diagrams of the stacking operation that takes place in the duplexing unit.

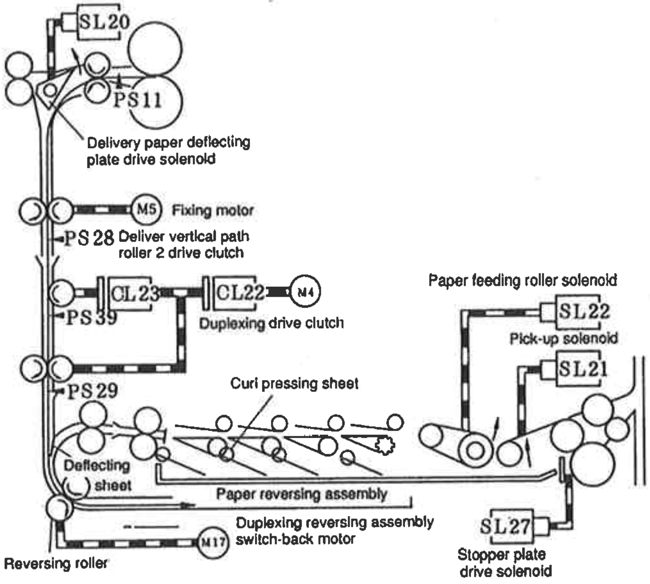

SL20
PS11
Delivery paper deflecting plate drive solenoid
M5
Fixing motor
PS 28
Deliver vertical path roller 2 drive clutch
CL23
CL22
M4
PS39
Duplexing drive clutch
Paper feeding roller solenoid
SL22
Pick-up solenoid
SL21
PS29
Curl pressing sheet
Deflecting sheet
Paper reversing assembly
Duplexing reversing assembly switch-back motor
M17
SL27
Reversing roller
Stopper plate drive solenoid

Figure 3-617

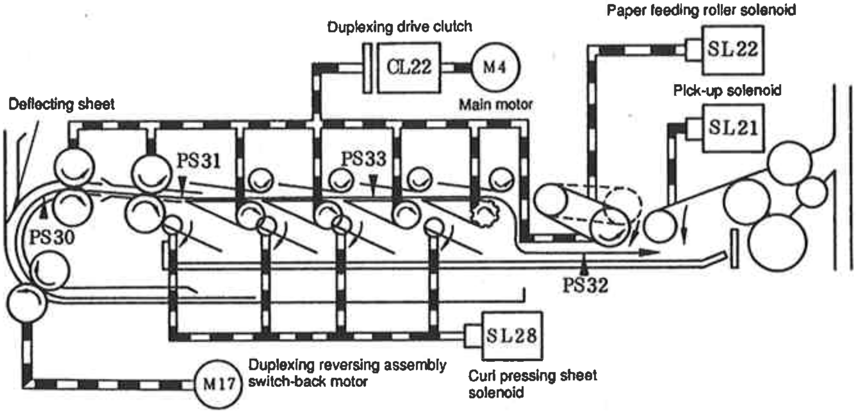

Duplexing drive clutch
CL22
M4
Main motor
Paper feeding roller solenoid
SL22
Pick-up solenoid
SL21
Deflecting sheet
PS31
PS33
PS30
PS32
SL28
M17
Duplexing reversing assembly switch-back motor
Curl pressing sheet solenoid

Figure 3-618

3. Changing the Paper Path in the Duplexing Feeding Assembly

The paper path in the duplexing feeding assembly is changed in two-sided copy mode to suit the size of copy paper.

As many as five different paths may be formed, each formed by four paper deflecting plate.

Each óf the paper deflecting plate is driven by its respective solenoid.

Ref. No.	Paper length	Typical paper size	Paper deflecting plate drive solenoid			
			SL23	SL24	SL25	SL26
①	443.83 mm 390.57 mm	11″ × 17″ A3	ON	OFF	OFF	OFF
②	368.92 mm 315.66 mm	B4 LGL	OFF	ON	OFF	OFF
③	299.58 mm 246.32 mm	A4R LTR-R	OFF	OFF	ON	OFF
④	231.54 mm 178.28 mm	LTR A4 B5R	OFF	OFF	OFF	ON
⑤	163.50 mm 128.15 mm	B5	OFF	OFF	OFF	OFF

Table 3-608

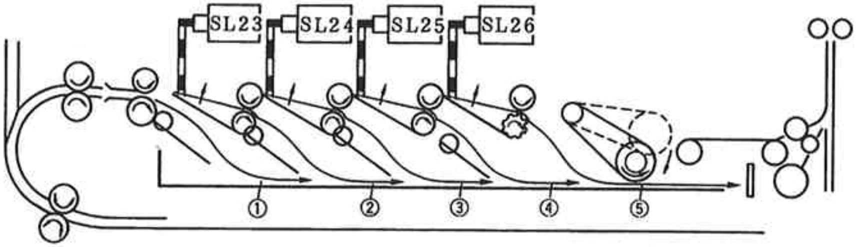


Figure 3-619

4. Curl Pressing Sheet

In the copier, curling of copy paper inside the duplexing unit could cause a stacking fault when sheets are stacked in two-sided copy mode.

To prevent such a fault, curl pressing sheets are used to hold down the trailing edge of copy paper, thereby ensuring proper stacking of the following paper.

Eight curl pressing sheets (2 × 4) are found inside the duplexing unit, and different pressing sheets are used according to the size of copy paper (see Figure 3-619; see the next section of ⑤); each time a sheet of copy paper arrives, all curl pressing sheets make a single rotation.

See Figure 3-620 for the sequence of operations.

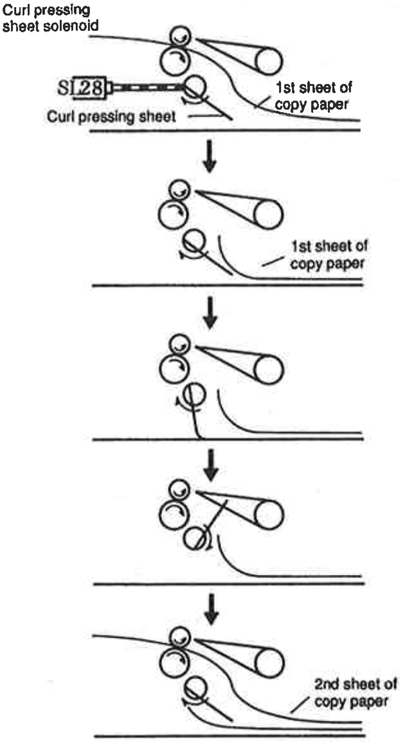

Curl pressing sheet solenoid
SL28
Curl pressing sheet
1st sheet of copy paper
1st sheet of copy paper
2nd sheet of copy paper

Figure 3-620

5. Stacking Operation in Path ⑤

If copy paper moves along path ⑤ (p. 3-138) and is stacked inside the duplexing unit, a curl pressing gear is used instead of a curl pressing sheet to hold down the trailing edge of the copy paper, ensuring the proper stacking of the next copy paper.

See Figure 3-621 for stacking operation that takes place in path ⑤.

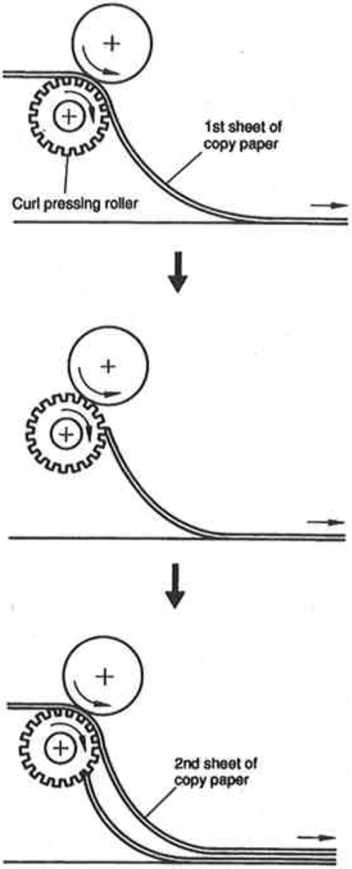

1st sheet of copy paper
Curl pressing roller
2nd sheet of copy paper

Figure 3-621

6. Paper Jogging Guide Plate

a. Outline

The paper jogging guide plate is used to keep the stack of copy paper in the duplexing stacking assembly in order, thereby preventing skew movements or jams at time of pick-up.

Each time a sheet of copy paper arrives, the paper jogging guide plate moves to come into contact with the edge of the paper.

b. Paper Jogging Operation

When the Copy Start key is pressed in two-sided copy mode, the duplexing stacking guide motor (M16) starts to move in reverse to move the paper jogging guide plate in the direction of the arrow shown in Figure 3-622.

The motor stops as soon as the light-blocking plate of the paper jogging guide plate blocks the guide home position sensor (PS34) of the duplexing stacking assembly.

The DC controller PCB sends the number of pulses that corresponds to the size of the copy paper.

In response, the motor rotates in normal direction to move the paper jogging guide plate to a point that suits the size of the paper used. Next, the motor starts to rotate in reverse to move and stop the paper jogging guide plate at a point about 8 mm (one side) away from the width of the copy paper; the paper jogging guide waits for the copy paper at this point.

When the copy paper arrives in the duplexing unit stacking assembly, the motor rotates in normal direction to move the guide plate by 8 mm and then rotates in reverse to move the guide plate by 8 mm to put the paper in line.

When the last copy paper arrives, the motor rotates in normal direction, in reverse, and in normal direction to be ready for copying on the second side.

The motor remains at rest during copying on the second side; it remains at rest until the next copying operation starts for the first side.

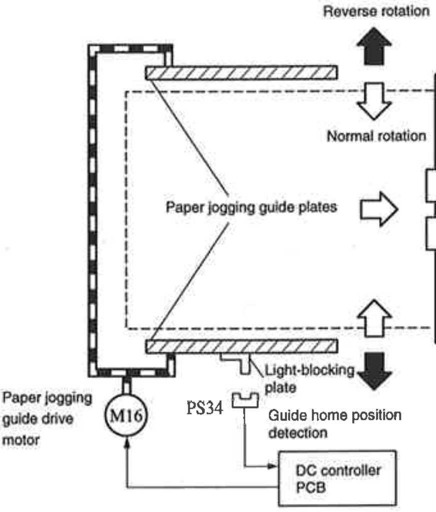

Reverse rotation
Normal rotation
Paper jogging guide plates
Light-blocking plate
Paper jogging guide drive motor
M16
PS34
Guide home position detection
DC controller PCB

Figure 3-622 Tray (top view)

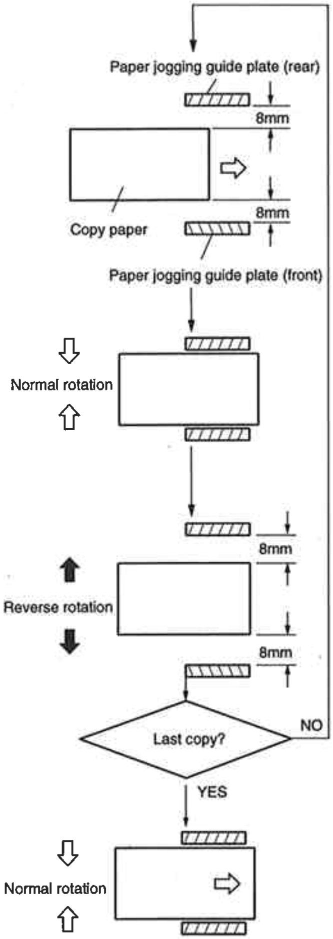

Paper jogging guide plate (rear)
8mm
Copy paper
8mm
Paper jogging guide plate (front)
Normal rotation
8mm
Reverse rotation
8mm
Last copy?
NO
YES
Normal rotation

Figure 3-623 Paper Jogging Operation

c. Sequence of Copying Operations (two-sided, 1st side)

Two-Sided (1st side), A4, 2 Copies Continuous, 4-Color, DIRECT

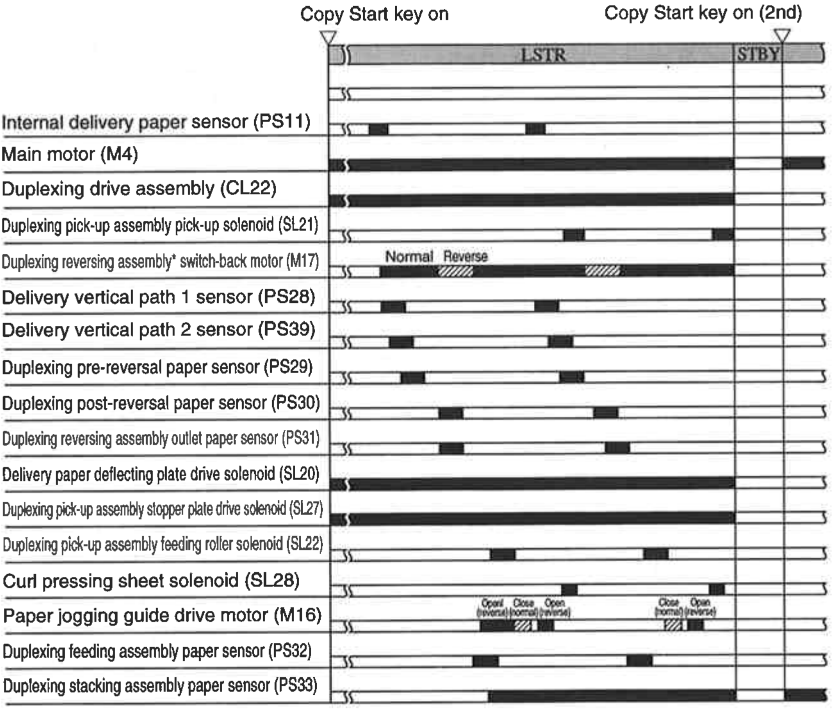

Copy Start key on
Copy Start key on (2nd)
LSTR
STBY
Internal delivery paper sensor (PS11)
Main motor (M4)
Duplexing drive assembly (CL22)
Duplexing pick-up assembly pick-up solenoid (SL21)
Duplexing reversing assembly* switch-back motor (M17)
Normal
Reverse
Delivery vertical path 1 sensor (PS28)
Delivery vertical path 2 sensor (PS39)
Duplexing pre-reversal paper sensor (PS29)
Duplexing post-reversal paper sensor (PS30)
Duplexing reversing assembly outlet paper sensor (PS31)
Delivery paper deflecting plate drive solenoid (SL20)
Duplexing pick-up assembly stopper plate drive solenoid (SL27)
Duplexing pick-up assembly feeding roller solenoid (SL22)
Curl pressing sheet solenoid (SL28)
Paper jogging guide drive motor (M16)
Open (reverse)
Close (normal)
Open (reverse)
Close (normal)
Open (reverse)
Duplexing feeding assembly paper sensor (PS32)
Duplexing stacking assembly paper sensor (PS33)

Figure 3-624

*1 A4 Paper
- Normal rotation ....high-speed control
- Reverse rotation ......high-speed control

A3 Paper
- Normal rotation ....low-speed control (delivery vertical path 2 sensor detects paper)
- Normal rotation ....high-speed control (trailing edge of paper has moved past delivery vertical path 2 sensor)
- Reverse rotation ......high-speed control

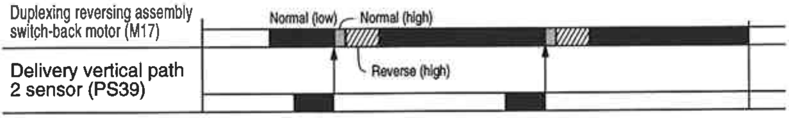

Duplexing reversing assembly switch-back motor (M17)
Normal (low)
Normal (high)
Reverse (high)
Delivery vertical path 2 sensor (PS39)

Figure 3-625

7. Pick-Up from the Duplexing Unit

a. Outline

When copying on the second side of a two-sided copy, the appropriate paper stacked inside the duplexing unit stacking assembly is picked up.

When the Copy Start key is pressed, the stopper plate shifts down, and the duplexing unit pick-up clutch (CL19) turns on, thereby transmitting the drive of the pick-up motor (M6) to the pick-up roller to pick up copy paper. After pick-up, the pick-up roller moves away from the paper by the action of the pick-up roller solenoid (SL21).

Then, one of the sheets of copy paper is moved to the vertical path assembly by the feeding roller and separation roller.

Figure 3-626 shows an outline of the pick-up operation that takes place in the duplexing unit.

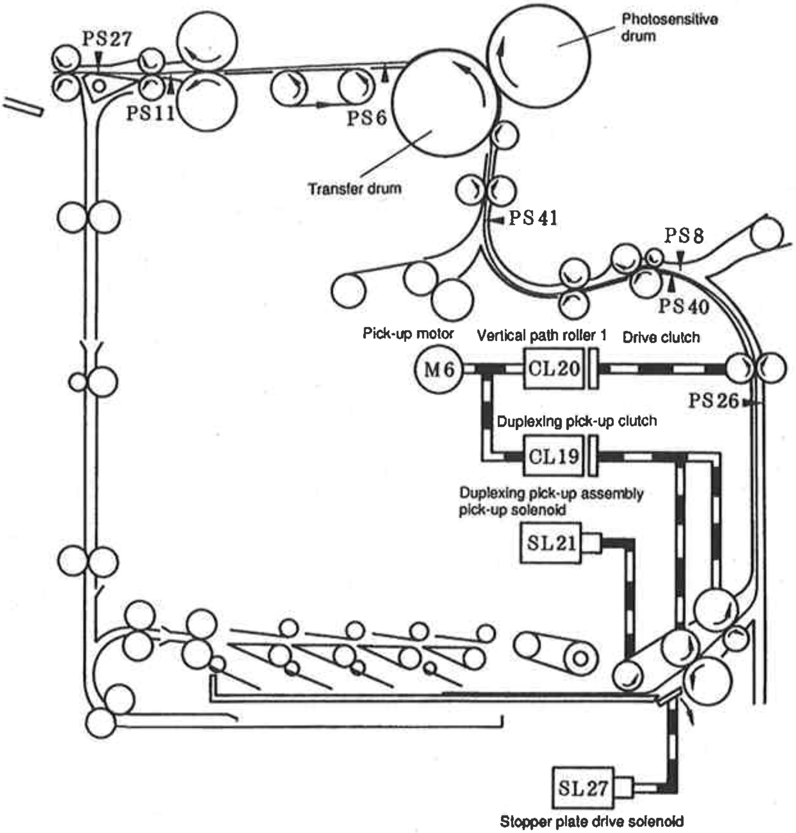

PS27
PS11
PS6
Photosensitive drum
Transfer drum
PS41
PS8
PS40
Pick-up motor
Vertical path roller 1
Drive clutch
M6
CL20
PS26
Duplexing pick-up clutch
CL19
Duplexing pick-up assembly pick-up solenoid
SL21
SL27
Stopper plate drive solenoid

Figure 3-626

b. Sequence of Pick-Up Operations (duplexing unit)

Duplexing unit, A4, 2 Copies Continuous, 4-Color, DIRECT

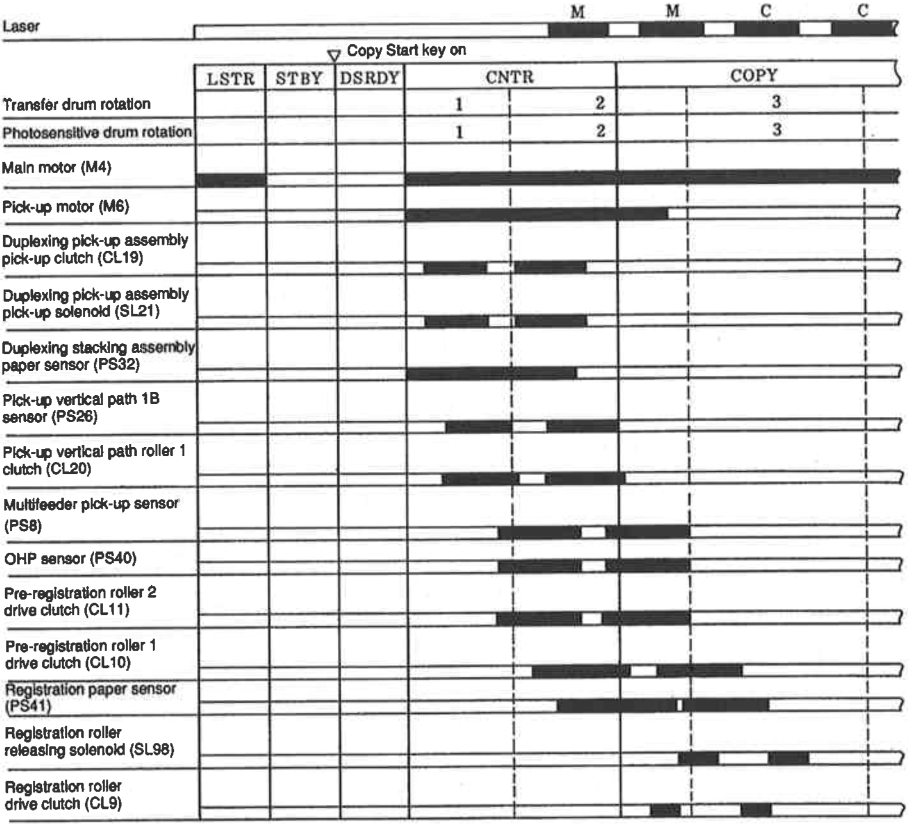


Figure 3-627

D. Controlling Registration and Retention

1. Outline

After pick-up, the copy paper is made to form an arc against the registration roller for correcting any skew, and is moved to the retention roller by the registration roller; the retention roller then puts and holds the copy paper on the transfer sheet. The rotation of the registration roller and the rotation of the engaging/releasing roller, and retention roller are driven by the drive of the main motor through their respective solenoids/clutches.

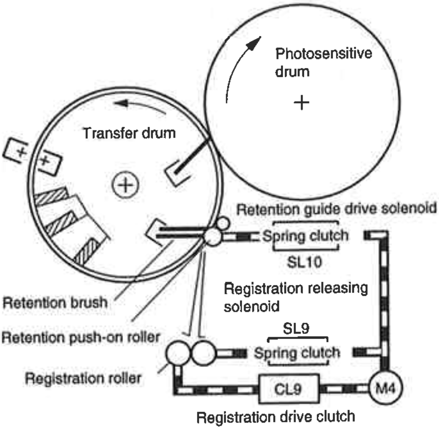

Photosensitive drum
Transfer drum
Retention guide drive solenoid
Spring clutch
SL10
Registration releasing solenoid
SL9
Spring clutch
Retention brush
Retention push-on roller
Registration roller
CL9
M4
Registration drive clutch

Figure 3-628

2. Releasing the Registration Roller

When the copy paper sent by the registration roller is placed on the transfer drum sheet, the registration releasing solenoid (SL9) turns on, thereby causing the registration engaging cam to rotate and releasing the registration link roller from the registration roller by the drive of the main motor.

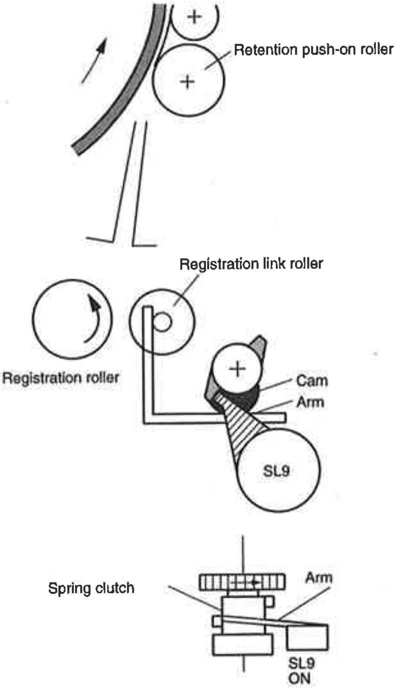

Retention push-on roller
Registration link roller
Registration roller
Cam
Arm
SL9
Spring clutch
Arm
SL9 ON

Figure 3-629

3. Retention Roller

The copier's transfer drum does not have a gripper, and copy paper is held to the transfer drum by means of static electricity.

During copying operation, the retention guide drive solenoid (SL10) remains on as long as the length of the copy paper, thereby keeping the retention roller in contact with the transfer drum sheet. At this time, the retention brush turns on to keep the copy paper on the transfer drum sheet by means of static electricity.

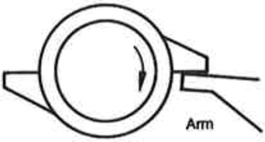


Figure 3-630 Control Cam (rear view)

Reference:

1. When making a mono-color copy, the paper is separated before making a full rotation; for this reason, SL10 does not turn off during copying operation but remains on.
2. When two sheets of copy paper is retained, SL10 does not turn off over the gap between the two sheets.

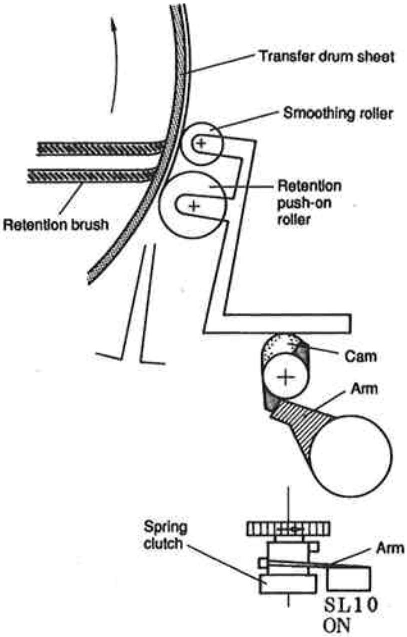

Transfer drum sheet
Smoothing roller
Retention push-on roller
Retention brush
Cam
Arm
Spring clutch
Arm
SL10 ON

Figure 3-631

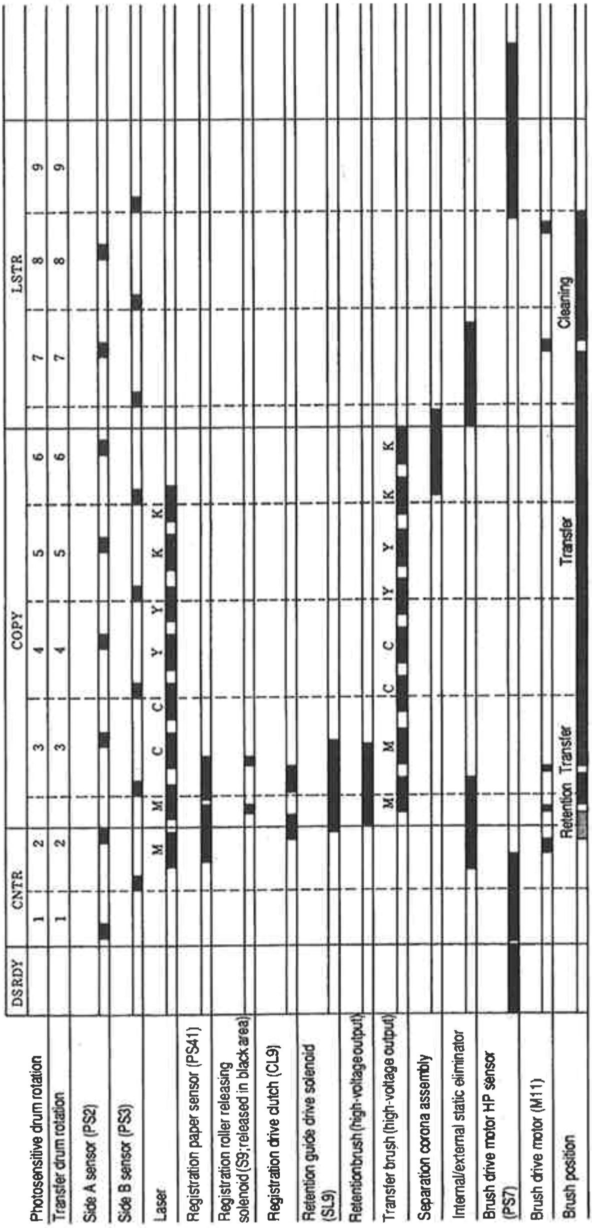


Figure 3-632 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Potential Control

E. Transfer Drum

1. Outline

The transfer drum is constructed as shown in Figure 3-633.

The transfer drum keeps copy paper on the transfer sheet by means of static electricity, and makes as many as four rotations; then, it moves the copy paper to the fixing assembly.

The transfer drum is butted against the photosensitive drum by the work of the main motor (M4) and cam when the transfer drum drive solenoid (SL13) is on. The transfer drum is rotated by the drive of the drum motor (M2) by way of the rotation of the photosensitive drum.

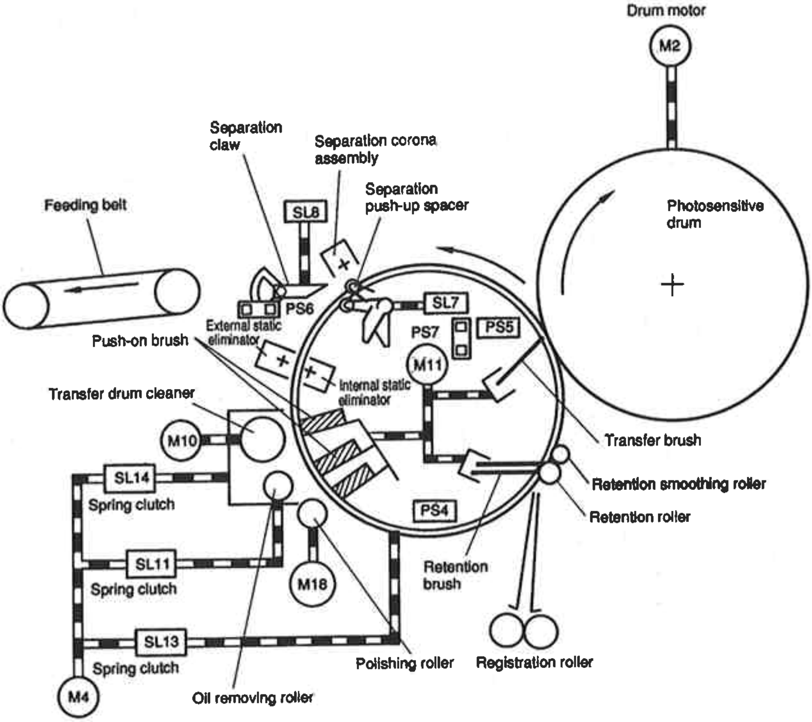
The feeding belt and registration roller, on the other hand are driven by the main motor (M4).

The transfer drum cleaner is engaged by the transfer drum cleaner solenoid (SL14), and is driven by the transfer drum cleaning brush motor (M10).

When the oil removing roller is driven by the main motor when the transfer drum cleaner solenoid (SL14) and oil removing roller solenoid (SL11) turn on; the polishing roller is driven by the polishing roller motor (M18).

Each of the brushes inside the transfer drum is driven by the brush drive motor.

The separation claw and separation push-up roller are each driven by separate solenoids.


Drum motor
M2
Separation claw
Separation corona assembly
Separation push-up spacer
Feeding belt
SL8
PS6
Photosensitive drum
SL7
PS7
PS5
External static eliminator
Push-on brush
M11
Internal static eliminator
Transfer drum cleaner
M10
SL14
Spring clutch
Transfer brush
Retention smoothing roller
Retention roller
PS4
SL11
Spring clutch
M18
Retention brush
SL13
Spring clutch
Polishing roller
Registration roller
M4
Oil removing roller

PS4: Pre-transfer paper sensor
PS5: Post-transfer paper sensor
PS6: Separation sensor
PS7: Brush drive motor HP sensor
SL7: Separation push-up solenoid
SL8: Separation claw drive solenoid
SL11: Oil removing roller solenoid
SL13: Transfer drum drive solenoid
SL14: Transfer drum cleaner solenoid
M2: Drum motor
M4: Main motor
M10: Transfer drum cleaning brush motor
M11: Brush drive motor
M18: Polishing roller motor

Figure 3-633

2. Controlling the Engagement of the Brushes Inside the Transfer Drum

Inside the transfer drum are found the retention brush, transfer brush, and push-on brush for cleaning. Each of the brushes are away from the transfer drum sheet standby, and they are engaged as necessary with the transfer drum sheet by their respective engaging cams. As shown in Figure 3-634, the three engaging cams are rotated by the drive of the brush drive motor (M11).

Figure 3-635,-636,-637 is a diagram showing the state of each brush and cam.

The copier's brush drive motor is a stepping motor, which controls the rotation of the cams to drive the brushes by applying specific pulses to the brush drive motor after the DC controller PCB has detected that the brush drive motor is at its home position by the brush drive motor HP sensor (PS7).

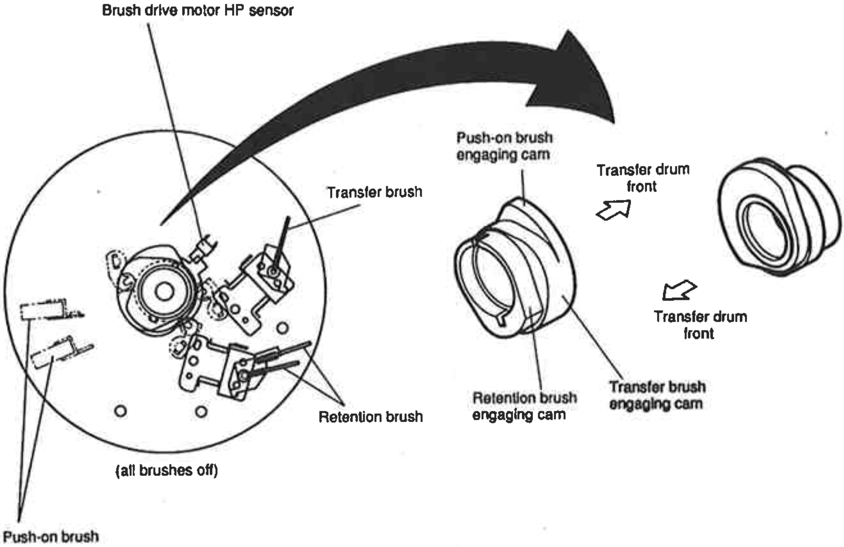

Brush drive motor HP sensor
Push-on brush engaging cam
Transfer drum front
Transfer brush
Transfer drum front
Retention brush
Retention brush engaging cam
Transfer brush engaging cam
(all brushes off)
Push-on brush

Figure 3-634

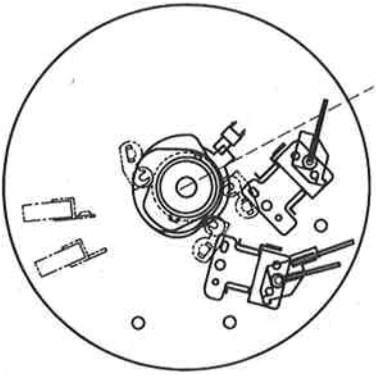
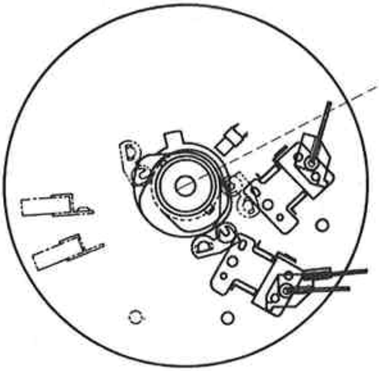
Home position 	All brushes, i.e., retention brush, transfer brush, and push-on brush are off.
Retention 	The retention brush is on; the transfer brush and push-on brush are off.

Figure 3-635

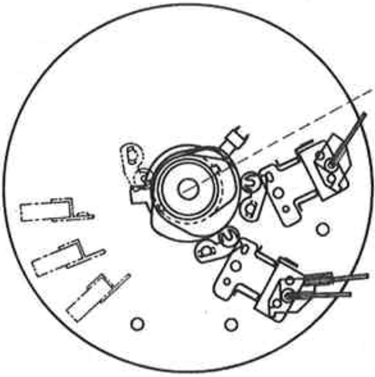
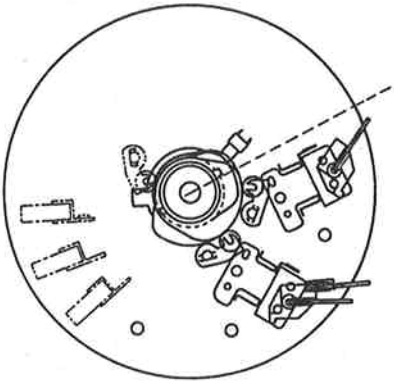
Transfer of 1st color 	The retention brush and transfer brush are on; the push-on brush is off.
Transfer of 2nd to 4th colors 	The retention brush/transfer brush turns on, and the push-on brush turns off; however, the retention brush turns off if LTR-R is selected.

Figure 3-636

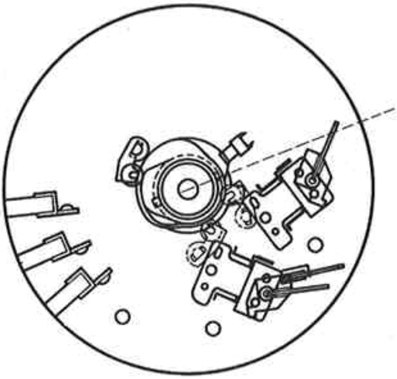
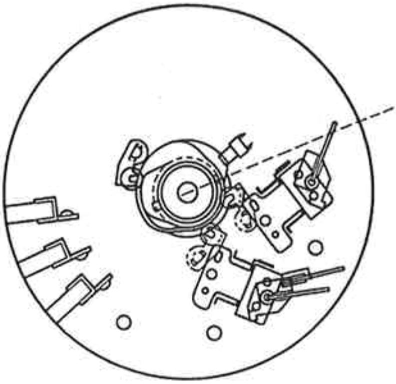
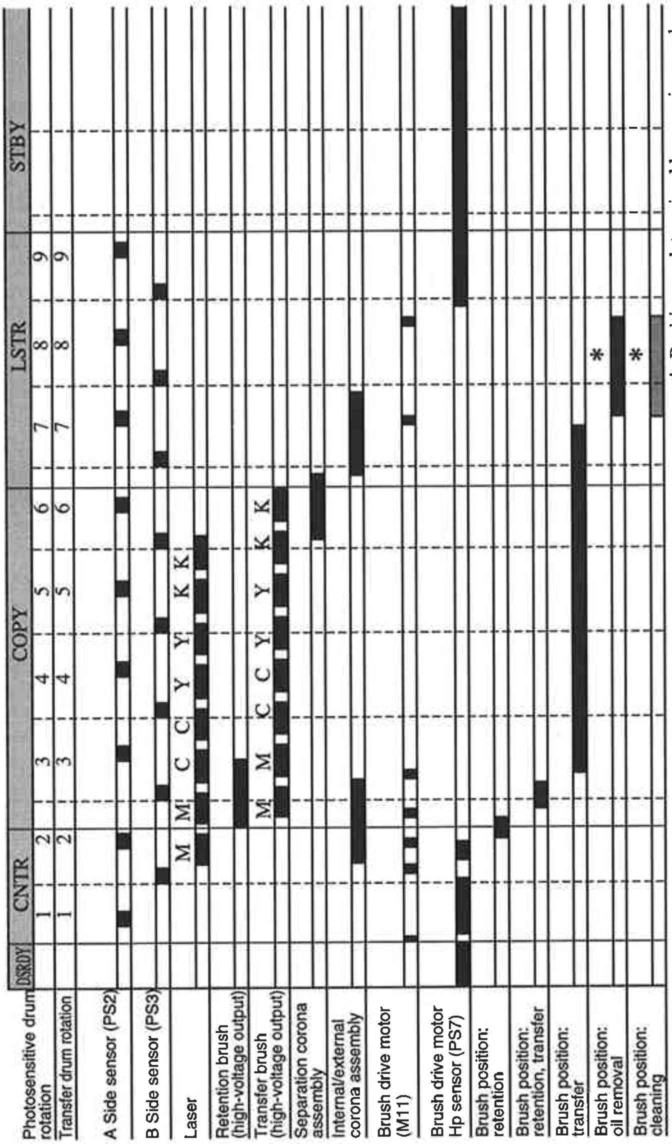
Transfer drum sheet cleaning 	The push-on brush is on; the retention brush and transfer brush are off.
Oil removing/cleaning 	The push-on brush is on; the transfer brush and retention brush are off.

Figure 3-637



* :Position as determined by copying mode.

Figure 3-638 Brush Position A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1

3. Separation Control

The copier executes separation, for both side A and side B, by its separation claw and separation push-up roller. See Table 3-640 for how separation is executed.

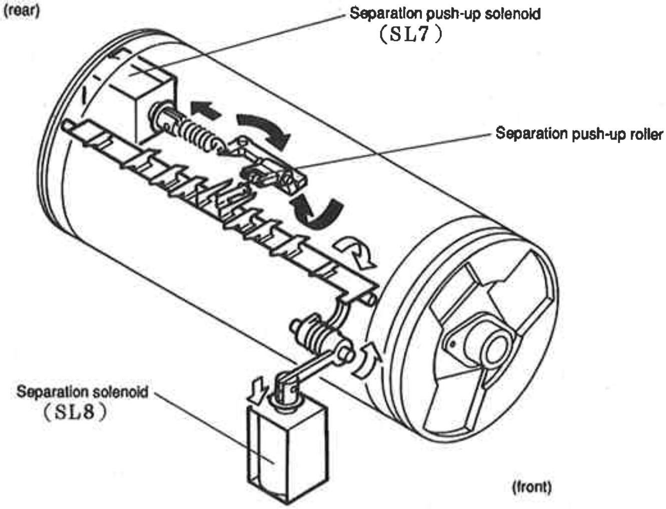
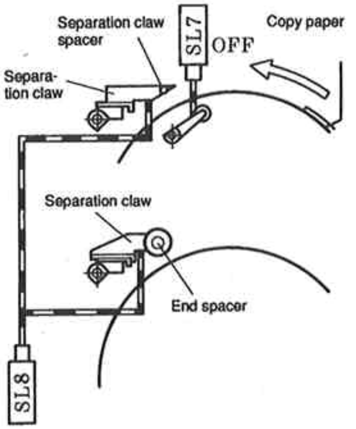

(rear)
Separation push-up solenoid (SL7)
Separation push-up roller
Separation solenoid (SL8)
(front)

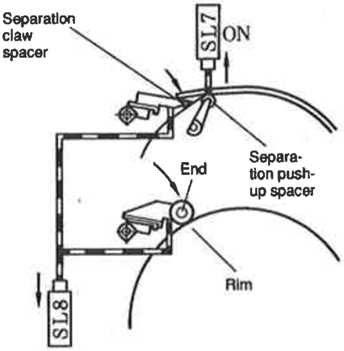
Figure 3-639

<table>
<tr>
<td>1</td>
<td>



Separation claw spacer
SL7
OFF
Copy paper
Separa-tion claw
Separation claw
End spacer
SL8

</td>
<td>The diagram shows the condition immediately after transfer to copy paper.
The separation claw solenoid (SL8) and separation push-up solenoid (SL7) are off.</td>
</tr>
<tr>
<td>2</td>
<td>



Separation claw spacer
SL7
ON
End
Separa-tion push-up spacer
Rim
SL8

</td>
<td>The separation solenoid (SL8) and separation push-up solenoid (SL7) turn on, thereby putting the separation spacer in contact with the transfer drum sheet. The separation claw is away from the transfer drum sheet for a distance equal to the thickness of the separation claw.
By the work of SL7, the separation push-up roller pushes up the transfer drum sheet from inside to deform a portion of the transfer drum sheet, thereby increasing the curvature.
Thereafter, the body of the copy paper serves to move its leading edge away from the transfer drum sheet, at which time the separation claw moves in to trigger separation.</td>
</tr>
</table>

Figure 3-640

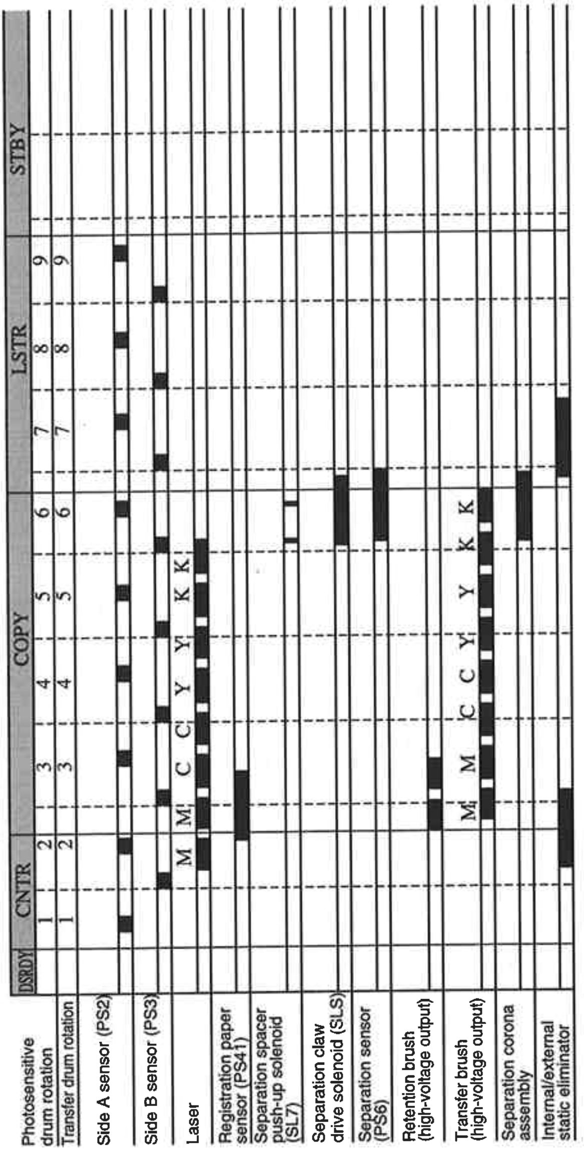


Figure 3-641 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette1 Potential Control

4. Cleaning the Transfer Drum Sheet

Since the transfer drum sheet keeps copy paper on it by means of static electricity, it is subject to adhesion of foreign matter. The presence of foreign matter on the transfer drum sheet is likely to soil the back of copy paper and cause faulty transfer or retention.

To avoid such problems, the transfer drum sheet is cleaned by the following methods:

1. cleaning by the external brush/push-on brush.
2. cleaning by the oil removing roller.
3. cleaning by the polishing roller.

These cleaning operations may be roughly classified as shown in Table 6-609.

Type	Timing	Cleaner
Normal cleaning	Post rotation	External brush/internal brush (retention static elimination)
Duplexing cleaning	Post rotation after duplexing copying .	External brush/internal brush + oil removing roller
Specific cleaning	Post rotation after making specific number of copies	Polishing roller

Table 6-609

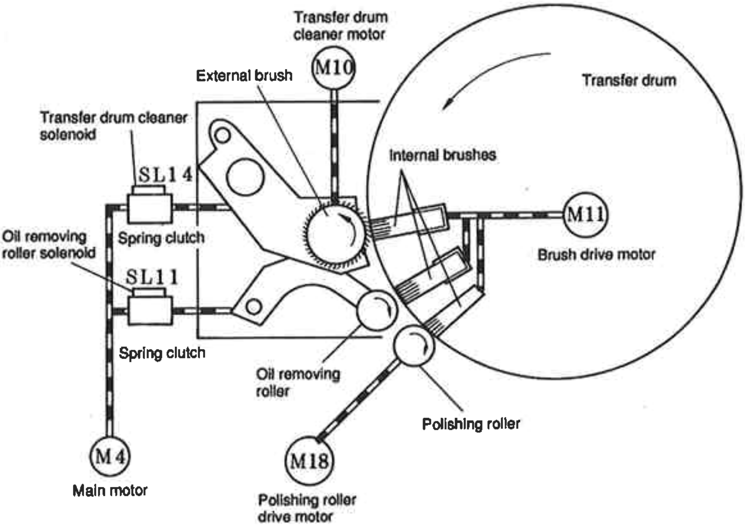

Transfer drum cleaner motor
External brush
M10
Transfer drum
Transfer drum cleaner solenoid
SL14
Internal brushes
Oil removing roller solenoid
Spring clutch
SL11
M11
Brush drive motor
Spring clutch
Oil removing roller
Polishing roller
M4
Main motor
M18
Polishing roller drive motor

Figure 3-642

a. External Brush

The external brush is rotated at a high speed by the transfer cleaner motor (M10) in the opposite direction from the transfer drum sheet.

While the main motor (M4) is rotating, the transfer cleaner solenoid (SL14) turns on, causing the drive of the main motor to the cam through the spring clutch. The rotation of the cam in turn moves the transfer drum cleaner to butt against the transfer drum sheet.

The internal brush is butted against the transfer drum sheet by the work of the cam inside the transfer drum and by the drive of the brush drive motor (M11).

The transfer drum is cleaned during post rotation by the external brush.

The position of toner used for black toner density detection executed on the photosensitive drum corresponds to the position of the transfer drum connecting plate in relation to the transfer drum.

For this reason, the area in front and behind the transfer drum connecting plate is cleaned a single operation more than other areas of the transfer drum connecting plate.

The internal brush is released at the transfer drum connecting plate.

This consideration helps prevent the deformation of the internal brush which otherwise could be caused by interference between the transfer drum sheet fixing plate and internal brush.

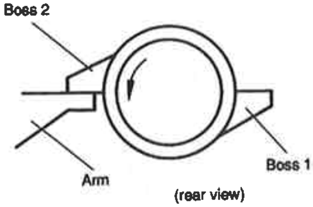


Figure 3-643 Control Cam

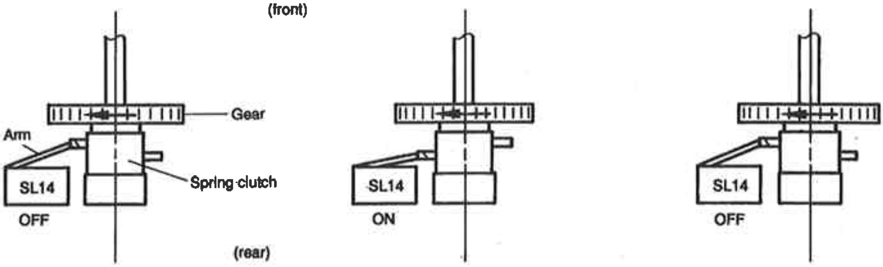


Figure 3-644

5. Oil Removing Roller

In two-sided copy mode, copy paper whose first side has already been fixed is retained on the transfer sheet, causing the transfer sheet to come into contact with fixing oil. If post rotation was started as it is, the fixing oil would move from the transfer sheet to the photosensitive drum, causing the next copy to suffer from such detrimental effects as fogging. To prevent such a problem, the copier butts the oil removing roller against the transfer drum after copying on the second side to clean the transfer drum.

The oil removing roller is butted by turning on the oil removing roller solenoid (SL11) using the drive from the main motor. At this time, the internal brush for the roller is butted from inside the transfer drum, and the transfer drum cleaner motor (M10) is turned on to rotate the external brush as well, thereby enhancing the cleaning efficiency.

6. Polishing Roller

a. Outline

Over a period of time, the transfer sheet starts to collect paper lint, which leads to weakening of retention. To correct such deterioration, the copier is provided with a mechanism that polishes the surface of the transfer sheet for a specific number of copies, thereby recovering the force of retention.

When the polishing roller drive motor (M18) turns on, the polishing roller is engaged with the transfer sheet to start link rotation of the polishing roller, thereby polishing the transfer sheet.

b. Operation

When the polishing roller drive motor (M18) turns on, the drive belt and the drive gear start to rotate, in turn rotating the spring clutch. The spring clutch is stopped after having made a half rotation by means of a stopper; since the motor (M18) keeps rotating, however, the polishing roller is butted against the transfer drum by the polishing roller engaging spring with the motor shaft as its fulcrum. The surface of the transfer drum sheet is polished in this condition.

The polishing roller is released and moved away from the transfer drum sheet by the work of the polishing roller returning spring.

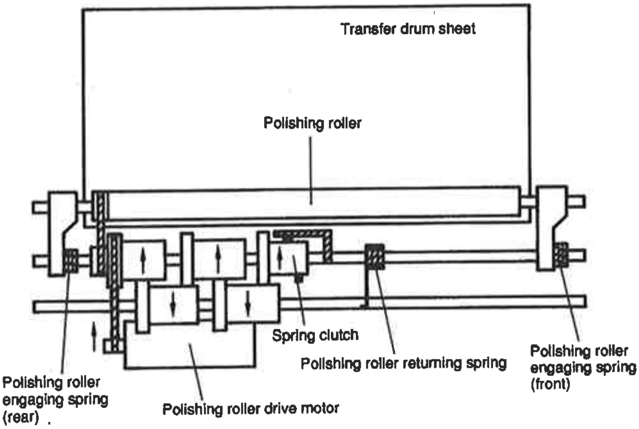

Transfer drum sheet
Polishing roller
Spring clutch
Polishing roller returning spring
Polishing roller engaging spring (front)
Polishing roller engaging spring (rear)
Polishing roller drive motor

Figure 3-645

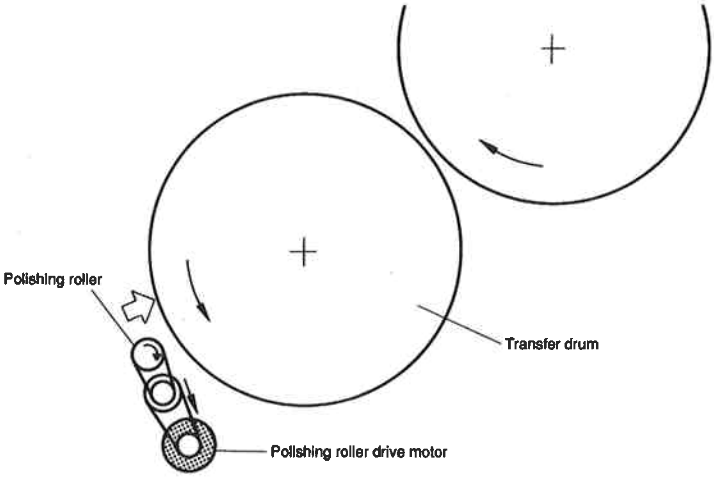


Figure 3-646 Cross Section

c. Conditions and Period of Operation

The polishing roller is operated under the following conditions and for the following time period:

Conditions	Time
The temperature of the fixing roller is 110°C when the power switch is turned on and, in addition, the switch is turned on after making 1,000 copies.	As long as the transfer drum makes 50 rotations. (The transfer cleaner remains in contact for 52 rotations.)
During post rotation after 12,000 copies (cumulative while the copier remains powered) have been made.	

F. Fixing/Delivery Assembly

1. Outline

The following loads are driven by the fixing motor (M5):

- Upper fixing roller
- Lower fixing roller
- Delivery roller
- Oil applying roller
- Fixing belt engagement
- Feeding belt

The cleaning belt is driven by the take-up solenoid (SL6).

To ensure proper fixing during two-sided copy or OHP copy mode, the copier controls the fixing speed in four different settings; this consideration also serves to make up for its path.

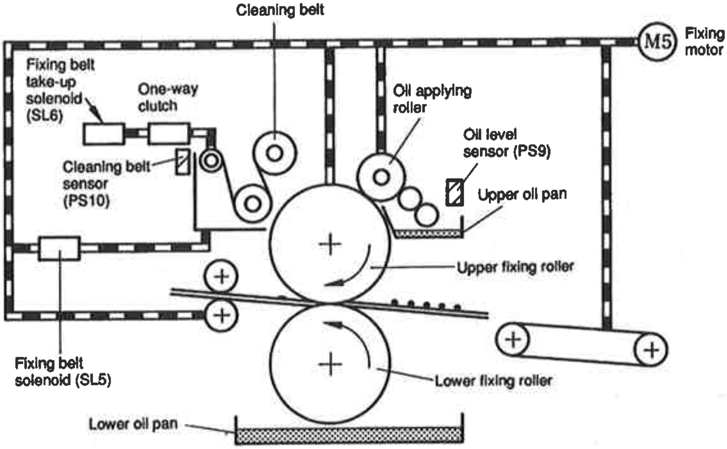

Cleaning belt
M5
Fixing motor
Fixing belt take-up solenoid (SL6)
One-way clutch
Oil applying roller
Oil level sensor (PS9)
Cleaning belt sensor (PS10)
Upper oil pan
Upper fixing roller
Fixing belt solenoid (SL5)
Lower fixing roller
Lower oil pan

Figure 3-647

2. Controlling the Fixing Roller Temperature

The upper fixing roller and lower fixing roller are each heated by a single fixing heater (H1, 600 W; H2, 600 W). The temperature of the upper fixing roller is monitored by a thermistor (THM1), and the temperature of the lower fixing roller is also monitored by a thermistor (THM2).

Fixing roller temperature is 'high'
→ Thermistor resistance is too 'low'
→ Voltage of fixing roller surface temperature detection signal (THM1, THM2) is 'low'

Based on the voltage, the microprocessor on the DC controller causes the upper fixing heater drive signal (UHON) and lower fixing heater drive signal (LHON) to go either '1' or '0' so as to keep the surface temperature of the upper roller and lower roller at a specific level.

Upper roller
full color copying.......controlled to 173°C (173°C)
mono color coping ....controlled to 185°C (185°C)
in STBY ....controlled to 170°C (170°C)

Lower roller
full color copying.......controlled to 171°C (162°C)
mono color coping ....controlled to 183°C (174°C)
in STBY ....controlled to 170°C (161°C)

(The value in parentheses indicates the temperature of the thermistor.)

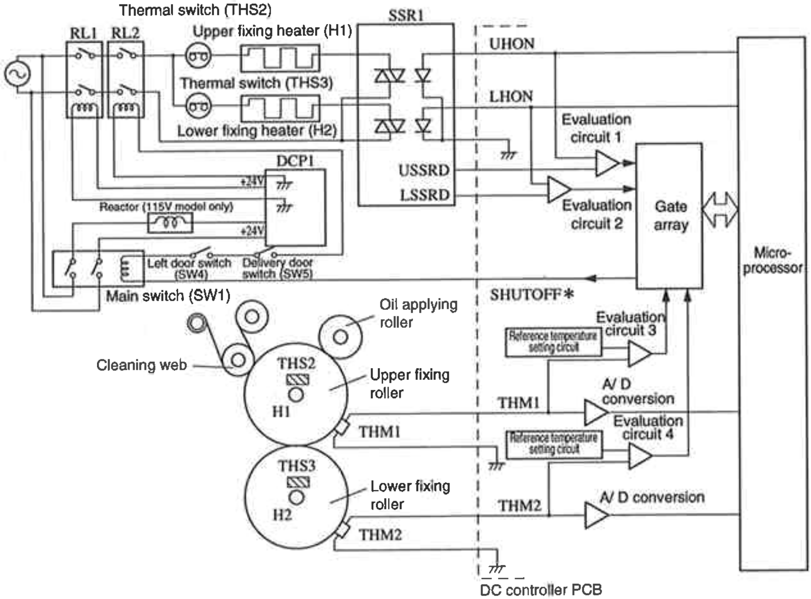

Thermal switch (THS2)
RL1
RL2
Upper fixing heater (H1)
SSR1
Thermal switch (THS3)
Lower fixing heater (H2)
DCP1
+24V
Reactor (115V model only)
+24V
Left door switch (SW4)
Delivery door switch (SW5)
Main switch (SW1)
USSRD
LSSRD
UHON
LHON
Evaluation circuit 1
Evaluation circuit 2
Gate array
Micro-processor
SHUTOFF*
Evaluation circuit 3
Reference temperature setting circuit
A/ D conversion
THM1
Evaluation circuit 4
Reference temperature setting circuit
THM2
A/ D conversion
Oil applying roller
Cleaning web
THS2
H1
Upper fixing roller
THM1
THS3
H2
Lower fixing roller
THM2
DC controller PCB

Figure 3-648

3. Protection Mechanism

The copier is equipped with the following four protection mechanisms to prevent problems in the fixing heater:

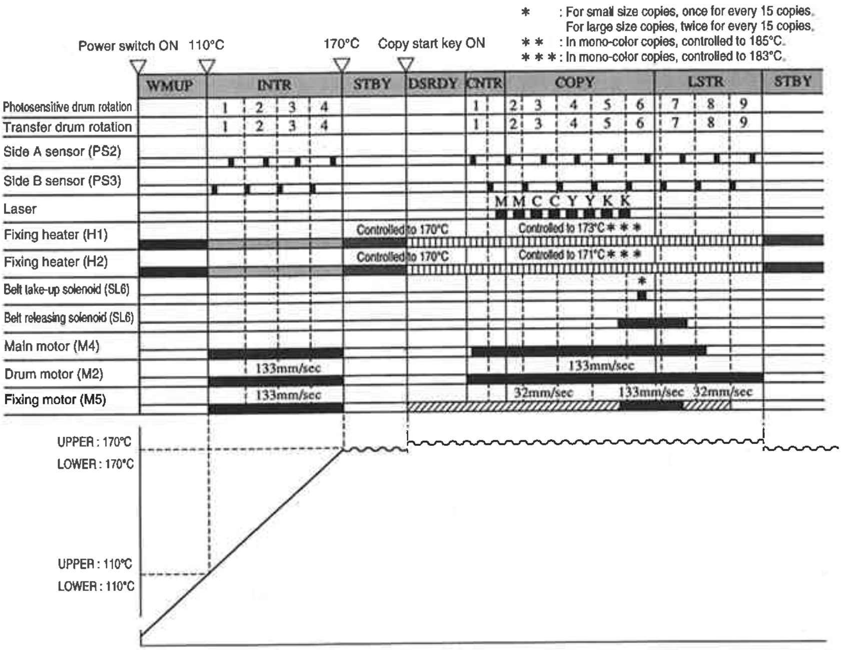
- The microprocessor monitors the voltage of thermistors THM1 and THM2; in response to an error, the copier indicates 'E000'.
- The gate array monitors the state of the SSR and heater drive signal; if the SSR is on in the absence of the heater drive signal from the microprocessor (USSRD, or LSSRD=1), it generates the SHUTOFF* signal to turn off RL2, thereby cutting power to the fixing heater.
- The gate array monitors the state of the SSR and heater drive signal; if the SSR is off in the presence of the heater drive signal (USSRD or LSSRD=0), an open circuit is identified in the heater circuit, and the copier indicates 'E000'.
- If the temperature inside the thermal switch for the upper roller exceeds 230°C, or if the temperature inside the thermal switch for the lower roller exceeds 230°C, the thermal switch turns off to cut out the power to the fixing heater.

Reference:

Once its contact opens, the thermal switch (THS2, THS3) cannot be used again; the contact will not recover even if the temperature lowers from error to normal.

Resetting for E000

1) Remove the cause.
2) Activate service mode, and select 'FUSER' under 'FUNC'.
3) Select 'E000-RLS', and set it to 'E000-RLS=1'.
4) Turn off and on the power switch.


Power switch ON
110°C
170°C
Copy start key ON
WMUP
INTR
STBY
DSRDY
CNTR
COPY
LSTR
STBY
Photosensitive drum rotation
Transfer drum rotation
Side A sensor (PS2)
Side B sensor (PS3)
Laser
Fixing heater (H1)
Fixing heater (H2)
Belt take-up solenoid (SL6)
Belt releasing solenoid (SL6)
Main motor (M4)
Drum motor (M2)
Fixing motor (M5)
1 2 3 4
1 2 3 4 5 6 7 8 9
M M C C Y Y K K
Controlled to 170°C
Controlled to 173°C＊＊＊
Controlled to 171°C＊＊＊
133mm/sec
32mm/sec
133mm/sec
32mm/sec
UPPER : 170°C
LOWER : 170°C
UPPER : 110°C
LOWER : 110°C

＊ : For small size copies, once for every 15 copies.
For large size copies, twice for every 15 copies.
＊＊ : In mono-color copies, controlled to 185°C.
＊＊＊ : In mono-color copies, controlled to 183°C.

Figure 3-648 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Plain

3. Driving the Cleaning Belt

The belt used to clean the upper fixing drive is engaged with the upper fixing roller when the fixing belt releasing solenoid (SL5) turns on and off in response to the belt drive signal (SL5D*; '0', '1') generated by the DC controller.

The belt is taken up 0.45 mm each time the fixing belt take-up solenoid (SL6) turns on and off. (The clearing belt itself becomes released when it is taken up.)

The fixing belt take-up solenoid turns on and off so many times as determined by the length of copy paper used.

Copy paper	Number of cleaning belt solenoid operations
Small size (182 to 216 mm)	Once for every 8 copies
Large size (217 to 432 mm)	Once for every 4 copies

Table 3-610

Note:

For transparencies, the solenoid turns on once for every 2 copies.

The edge of the belt is provided with a cut-out.

When the belt has been taken up to the point of the cut-out, the arm that has been supported by the belt drops and is detected by the belt length sensor (PS10).

When the sensor detects the arm, the copier indicates a message on its control panel.

Reference:

1. 'E005' appears when the cleaning belt solenoid has turned on and off about 270 times after the message has been indicated.
2. The belt is 5 m in length, and the cut-off is located at a point 4.7 m from the first end of the belt.
3. You must execute 'E005-RLS' of 'FUSER' under 'FUNC' in service mode and turn off then on the power switch whenever you have replaced the cleaning belt.

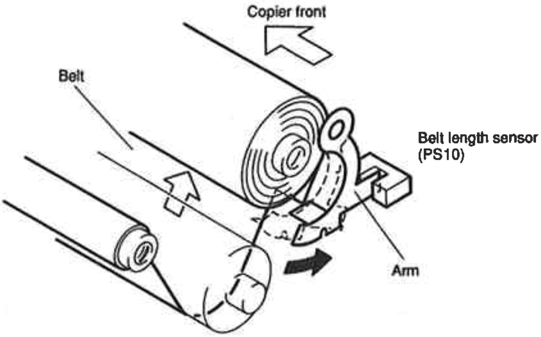


Figure 3-649

4. Fixing Oil Applying Mechanism

As shown in Figure 3-650, the copier uses a circulating mechanism for fixing oil.

The oil applying roller remains in contact with the upper fixing roller at all times to prevent offset by supplying the roller with fixing oil.

The work of the oil pump solenoid (SL12) draws oil from the oil bottle into the upper oil pan.

The level of the silicone oil in the upper oil pan is monitored by the oil level sensor (PS9) through detection of the position of the arm of the float floating in the upper oil pan.

If PS9 does not detect the arm at power-on, SL12 repeats turning on and off until PS9 detects it.

If PS9 does not detect the arm after operating SL12 for 10 min, the copier identifies the absence of oil, and indicates a message.

Then, 'E008' is indicated if PS9 does not detect the arm after making 100 copies.

The oil applying felt inside the oil pump solenoid serves as a filter for the circulating silicone oil.

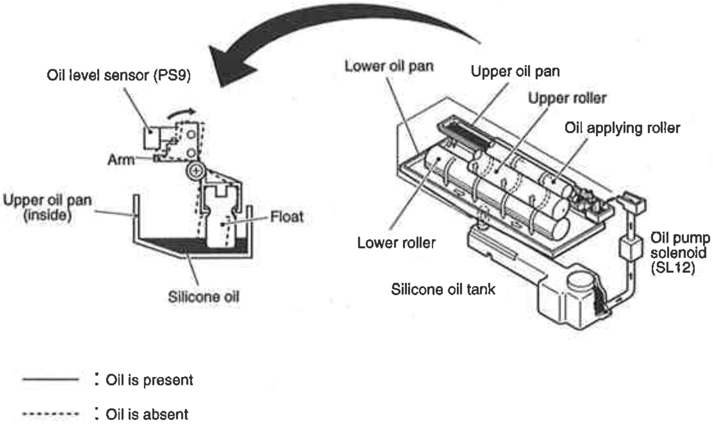

Oil level sensor (PS9)
Arm
Upper oil pan (inside)
Float
Silicone oil
Lower oil pan
Upper oil pan
Upper roller
Oil applying roller
Lower roller
Silicone oil tank
Oil pump solenoid (SL12)
: Oil is present
: Oil is absent

Figure 3-650

Reference:

To clear 'E008',

1) Pour fixing oil into the oil case.
2) Turn off and then off the power switch.
   - The oil supply mechanism is activated automatically with 'E008' still displayed; this operation ends in about 5 min.
3) Turn off and then on the power switch.

5. Controlling the Fixing Speed

The path in the copier's feeding assembly between the transfer drum and the fixing assembly is shorter than the path of conventional copiers; to accommodate the shorter path and to ensure proper fixing in two-sided copy mode or OHP copy mode, the copier controls the fixing speed in four settings.

- Normal mode (plain paper fixing) .... 133 mm/sec
- 2nd side of two-sided copy (plain paper)/special paper 1 .... 121 mm/sec*
- Thick paper (105 to 157g) mode .... 80 mm/sec
- OHP mode .... 80 mm/sec
- Pick-up/retention transfer (all paper types) mode/ special paper 2 .... 32 mm/sec

* Both 1st and 2nd faces

The fixing motor starts to rotate when the drive signal (M5ON*) goes '0'; the speed is varied based on the combination of speed switching signals (M5SPD0 and M5SPD1). If the rotation speed of the fixing motor deviates for some reason, the motor ready signal (M5RDY*) goes '1; in response, the DC controller indicates 'E014' on the control panel.

M5SPD0	M5SPD1	Fixing speed
0	0	133mm/sec
0	1	121mm/sec
1	0	80mm/sec
1	1	32mm/sec

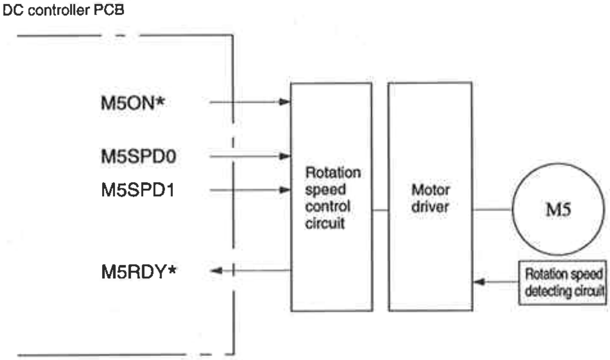
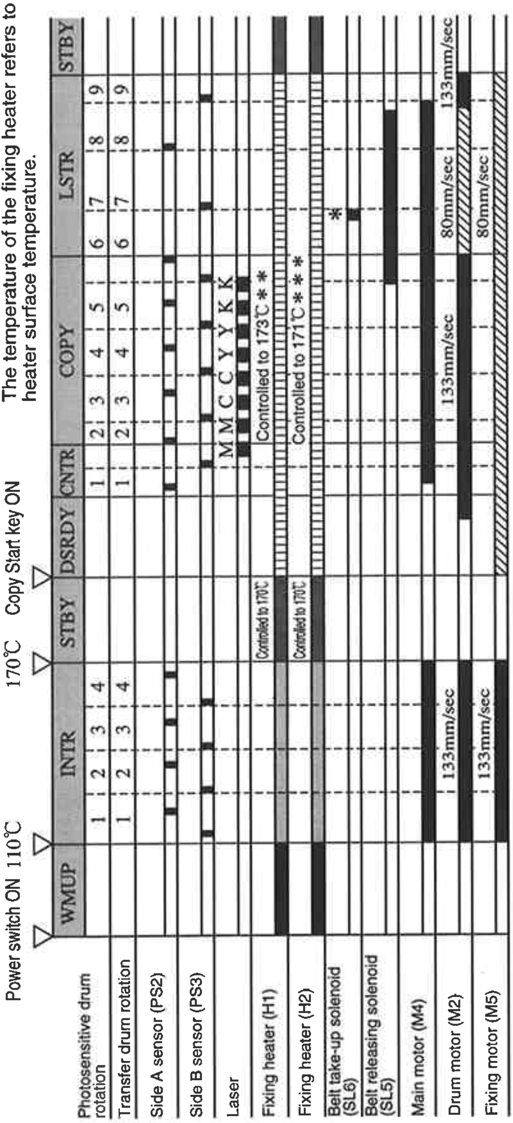

DC controller PCB
M5ON*
M5SPD0
M5SPD1
M5RDY*
Rotation speed control circuit
Motor driver
M5
Rotation speed detecting circuit

Figure 3-651

Reference:

During copying, the fixing web is engaged while in OHP mode and special paper 2 mode; it is disengaged in other modes.


Power switch ON
110℃
170℃
Copy Start key ON
WMUP
INTR
STBY
DSRDY
CNTR
COPY
LSTR
STBY
1
2
3
4
5
6
7
8
9
Photosensitive drum rotation
Transfer drum rotation
Side A sensor (PS2)
Side B sensor (PS3)
Laser
M M C C Y Y K K
Fixing heater (H1)
Controlled to 170℃
Controlled to 173℃**
Fixing heater (H2)
Controlled to 170℃
Controlled to 171℃***
Belt take-up solenoid (SL6)
*
Belt releasing solenoid (SL5)
Main motor (M4)
Drum motor (M2)
133mm/sec
80mm/sec
133mm/sec
Fixing motor (M5)
133mm/sec
133mm/sec
80mm/sec

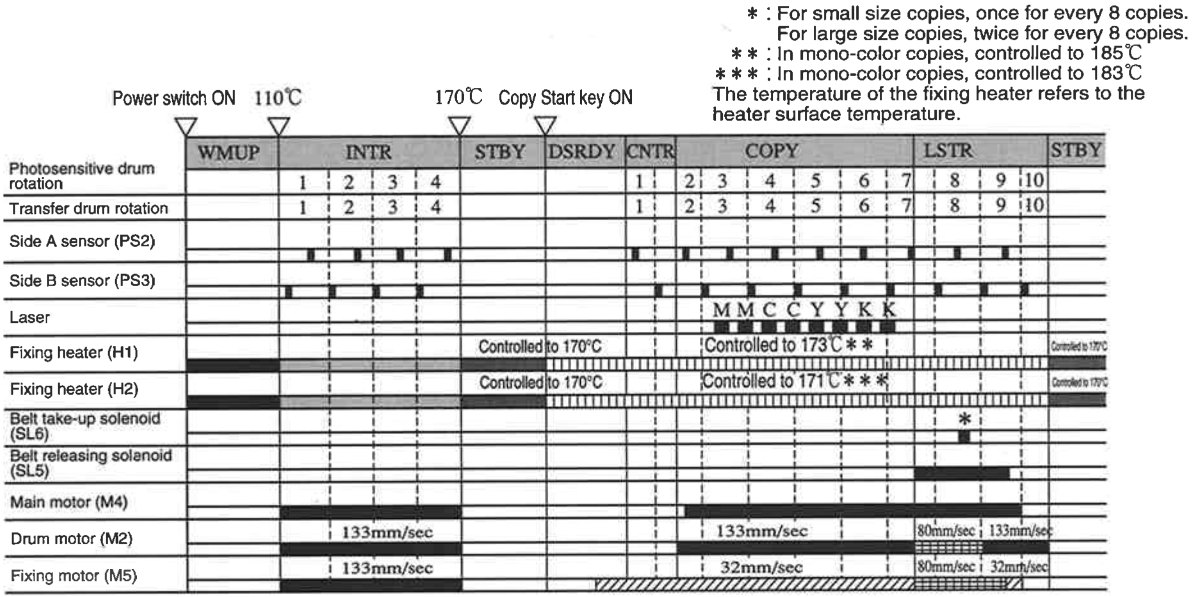
* : For small size copies, once for every 8 copies.
For large size copies, twice for every 8 copies.

** : In mono-color copies, controlled to 185℃

*** : In mono-color copies, controlled to 183℃

The temperature of the fixing heater refers to the heater surface temperature.

Figure 3-652 A4, LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, OHP


Power switch ON
110℃
170℃
Copy Start key ON
WMUP
INTR
STBY
DSRDY
CNTR
COPY
LSTR
STBY
Photosensitive drum rotation
Transfer drum rotation
Side A sensor (PS2)
Side B sensor (PS3)
Laser
Fixing heater (H1)
Fixing heater (H2)
Belt take-up solenoid (SL6)
Belt releasing solanoid (SL5)
Main motor (M4)
Drum motor (M2)
Fixing motor (M5)
1 2 3 4
1 2 3 4 5 6 7 8 9 10
M M C C Y Y K K
Controlled to 170°C
Controlled to 173℃＊＊
Controlled to 171℃＊＊＊
Controlled to 170°C
*
133mm/sec
32mm/sec
80mm/sec
133mm/sec
80mm/sec
32mm/sec

＊ : For small size copies, once for every 8 copies.
For large size copies, twice for every 8 copies.

＊＊ : In mono-color copies, controlled to 185℃

＊＊＊ : In mono-color copies, controlled to 183℃

The temperature of the fixing heater refers to the heater surface temperature.

Figure 3-653 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Thick Paper

* : For small size copies, once for every 8 copies.
For large size copies, twice for every 8 copies.
** : In mono-color copies, controlled to 185℃
*** : In mono-color copies, controlled to 183℃
The temperature of the fixing heater refers to the heater surface temperature.

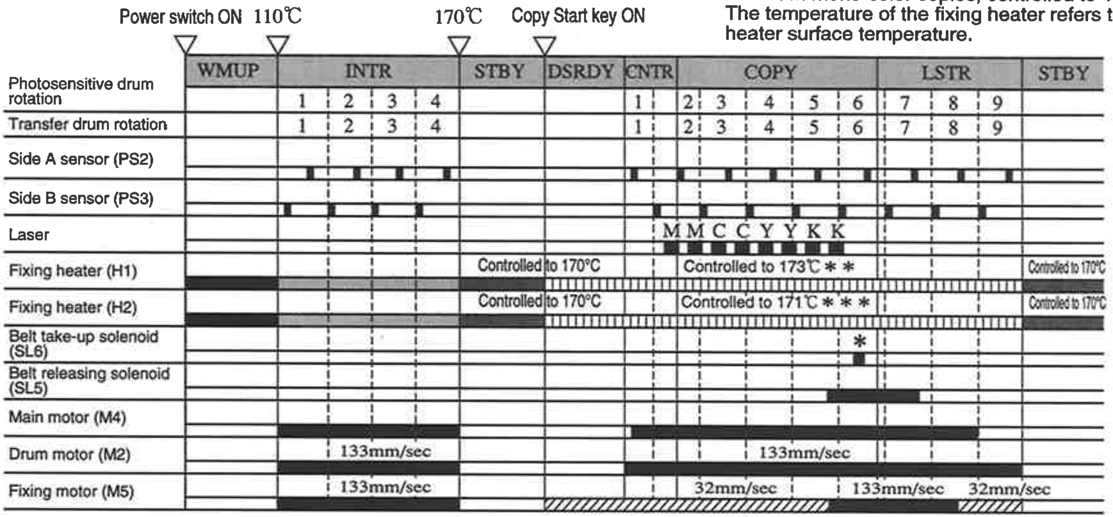

Power switch ON
110℃
170℃
Copy Start key ON
WMUP
INTR
STBY
DSRDY
CNTR
COPY
LSTR
STBY
Photosensitive drum rotation
Transfer drum rotation
Side A sensor (PS2)
Side B sensor (PS3)
Laser
Fixing heater (H1)
Fixing heater (H2)
Belt take-up solenoid (SL6)
Belt releasing solenoid (SL5)
Main motor (M4)
Drum motor (M2)
Fixing motor (M5)
1 2 3 4
1 2 3 4
1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9
M M C C Y Y K K
Controlled to 170°C
Controlled to 173℃ **
Controlled to 170°C
Controlled to 170°C
Controlled to 171℃ ***
Controlled to 170°C
*
133mm/sec
133mm/sec
133mm/sec
32mm/sec
133mm/sec
32mm/sec

Figure 3-654 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Plain

G. Detecting Jams

The copier is equipped with the following sensors to check the presence/absence of copy paper and to make sure that paper is moving properly:

Multifeeder pick-up sensor (PS8)
Pick-up vertical path 1 sensor (PS19/PS26*)
Pick-up vertical path 2 sensor (PS24)*
Pick-up vertical path 3 sensor (PS25)*
OHP sensor (PS40)
Registration paper sensor (PS41)
Pre-photosensitive drum cleaner paper sensor (PS43)
Pre-transfer sensor (PS4)
Post-transfer sensor (PS5)
Separation sensor (PS6)
Delivery inside sensor (PS11)
Delivery outside sensor (PS27)
Delivery vertical path 1 sensor (PS28)*
Duplexing pre-reversal paper sensor (PS29)*
Duplexing post-reversal paper sensor (PS30)*
Duplexing reversing assembly outlet paper sensor (PS31)*
Duplexing stacking assembly paper sensor (PS32)*
Duplexing feeding assembly paper sensor (PS33)*
Delivery vertical path 2 sensor (PS39)*

** For CLC800 only.*

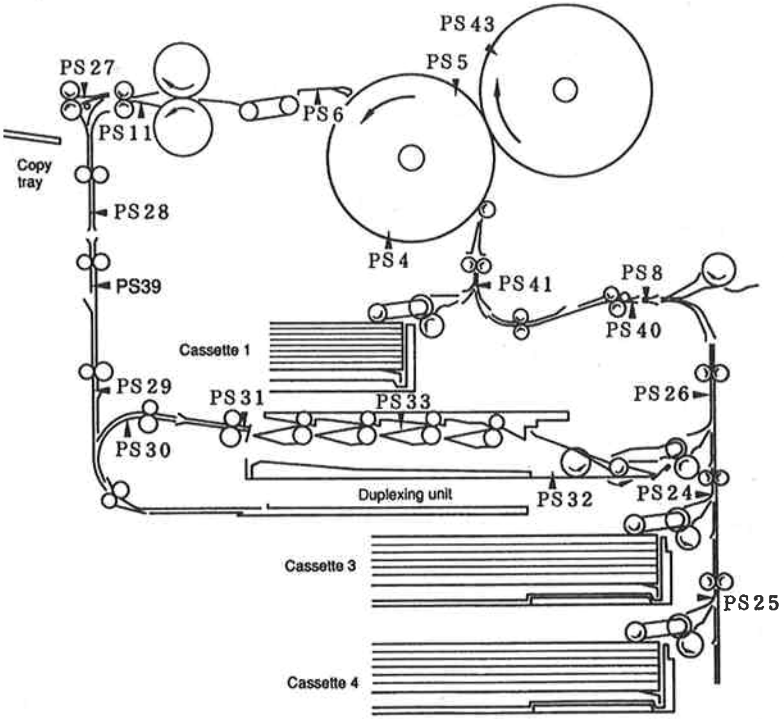

PS43
PS27
PS5
PS6
PS11
Copy tray
PS28
PS4
PS39
PS41
PS8
PS40
Cassette 1
PS29
PS31
PS33
PS26
PS30
Duplexing unit
PS32
PS24
Cassette 3
PS25
Cassette 4

Figure 3-655 (CLC800)

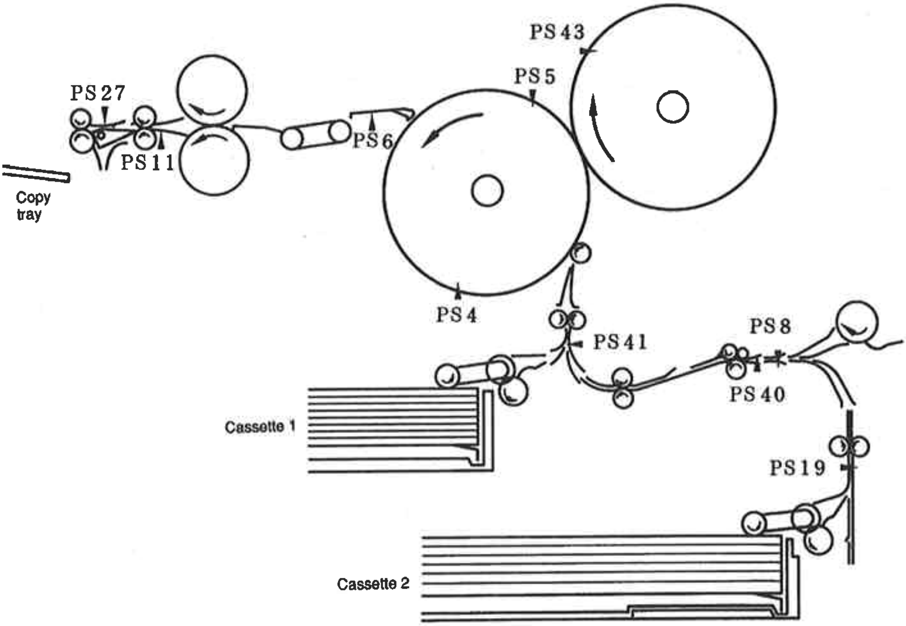


Figure 3-656 (CLC700)

The presence or absence of copy paper and jams is checked with reference to whether there is paper over the respective sensors at such times as stored in the microprocessor in advance.

The copier has a mechanism which retains data on how many copies remain to be made and the copy mode effective at time of jams; therefore, you need not reset the copy mode or the copy count after having opened its door for jam removal.

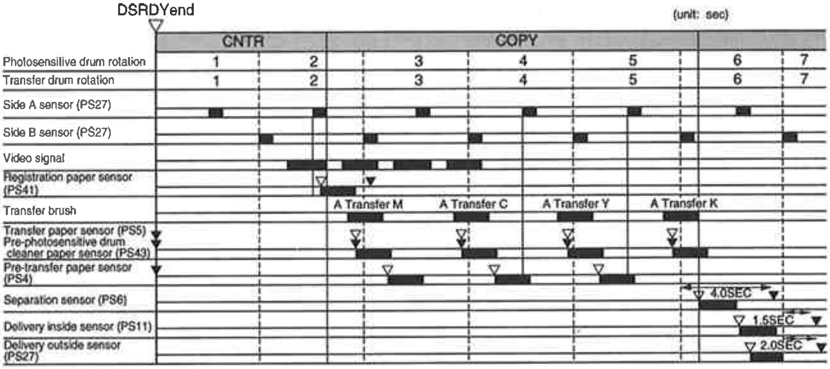
The copier also identifies a jam if its OHP sensor (PS40), separation sensor (PS6), or delivery sensor (PS11, PS27) detects the presence of copy paper at time of power-on.

Likewise, the copier identifies a jam if either pre-transfer paper sensor (PS4) or post transfer sensor (PS5) detects the presence of paper at time of power-on. A check is made once again at the home position of the transfer drum after the drum has made a single rotation; if any of the sensors detects the presence of paper, the copier identifies a jam.

The pre-photosensitive cleaner paper sensor (PS43) is a reflecting-type paper sensor and serves to prevent copy paper from sliding into the photosensitive drum cleaner by monitoring the photosensitive drum for the presence of paper; the sensor is effective only in TYPE 2 machines*.

The new type of DC controller PCB may be used for TYPE 1 CLC700/800*; however, it does not issue an error or jam indication if the sensor is faulty or if the connector is not connected.

*See the cover of Chapter 3.



▽ : Delay jam check (normal if copy paper is present)

▼ : Stationary jam (normal if copy paper is absent)

Figure 3-657 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Potential Control

VII. CONTROL PANEL

A. Outline

The copier's control panel consists of the control panel relay PCB, 200x640-dot liquid crystal panel, keypad PCB (including the pilot lamp), and subkey PCB, and it has the following functions:

① Data communication
② LCD processing
③ LCD contrast adjustment
④ Touch switch input

B. Operation

1. Data Communication

The microprocessor (CPU) on the reader controller PCB is used to control data communications.

2. LCD Processing

The microprocessor on the reader controller PCB sends commands to the LCD controller as necessary according to the stored program, and the LCD controller interprets these commands for execution. The LCD controller is also used to turn on and off the indications in response to commands from the program.

In addition, the LCD controller writes display character codes into the display memory RAM in sequence; the data in the display memory RAM is indicated on the display panel in response to the timing signal generated by the LCD controller.

3. Adjusting the LCD Contrast

VR5301 is found on the control panel relay PCB and may be used to adjust the contrast of the display panel.

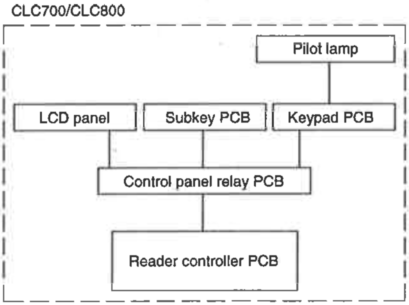
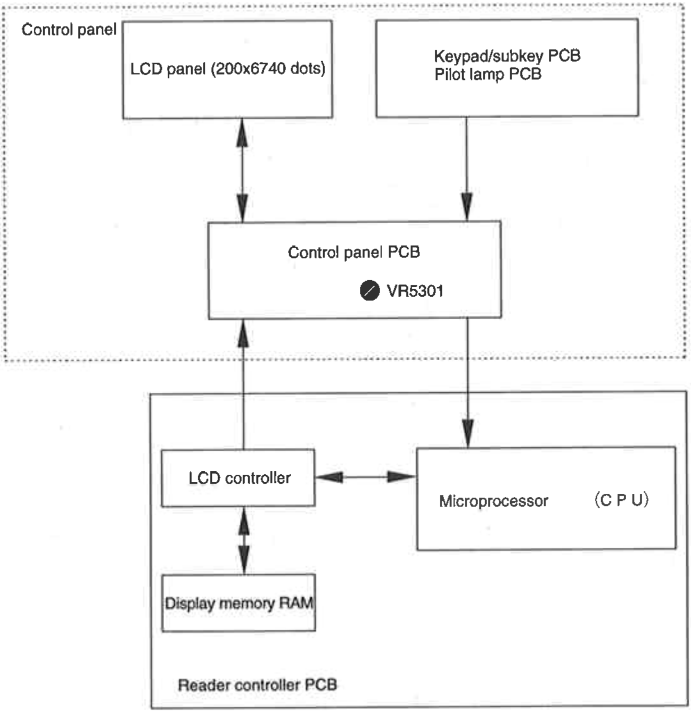


Figure 3-701



Control panel
LCD panel (200x6740 dots)
Keypad/subkey PCB
Pilot lamp PCB
Control panel PCB
VR5301
LCD controller
Microprocessor (C P U)
Display memory RAM
Reader controller PCB

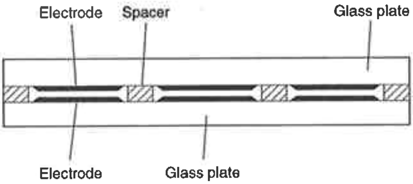
Figure 3-702

4. Touch Switch Input

The keys on the touch switch panel and the controller PCB on the control panel are connected as shown in Figure 3-703. The touch switch panel consists of two glass sheets coated with transparent conducting membranes with spacers in between, and is formed in a specific pattern of keys (12 columns × 20 rows).

When the face glass plate is pressed by a finger, the two glass sheets come into contact to provide electrical continuity.

In response, a pair of electrodes will let electricity pass, enabling detection of XY coordinates just like a conventional key matrix; in other words, the correspondence between the key scan signal from the control panel controller circuit and the input signal to the control panel controller circuit helps the control panel controller PCB to identify which key has been pressed.



Electrode
Spacer
Glass plate
Electrode
Glass plate

Figure 3-703

VIII. EDITOR

A. Outline

The copier's editor is of a static type, and consists of two tablets and a pen switch; one tablet each is dedicated to reading in horizontal (X) direction and to reading in vertical (Y) direction.

The controller PCB reads points pressed by the pen switch as settings of the area selected by the user.

The copier's tablet has electrode wires at intervals of 6 mm; the contact between these electrode wires and the pen switch by means of static electricity enables identification of points pressed by the pen switch.

B. Operation

When the pen switch presses the tablet, the CPU on the control PCB resorts to the decoder of the appropriate tablet, and applies pulses (1, 2, ..., n, n+1) to the appropriate electrode wires in sequence.

These pulses and the pen switch trigger a static contact, sending voltage fluctuations through the pen switch to the controller PCB. (See Figure 3-801.)

The level of voltage that have been read is converted to digital signals by the A/D converting circuit of the controller PCB; the CPU then makes computations by way of converting them into areas in units of mm, and sends the results to the copier.

Reference:

Since the points of input are computed based on static contacts, a thick original (4 mm max.) may be placed on the editor. However, you may not use conductive materials, or pressure-sensitive paper or carbon-backed paper.

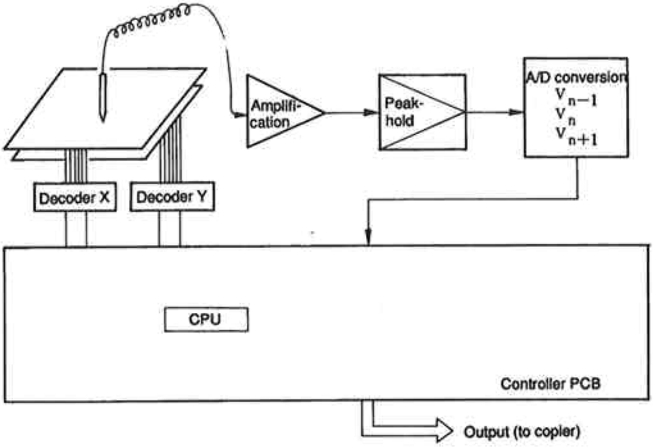
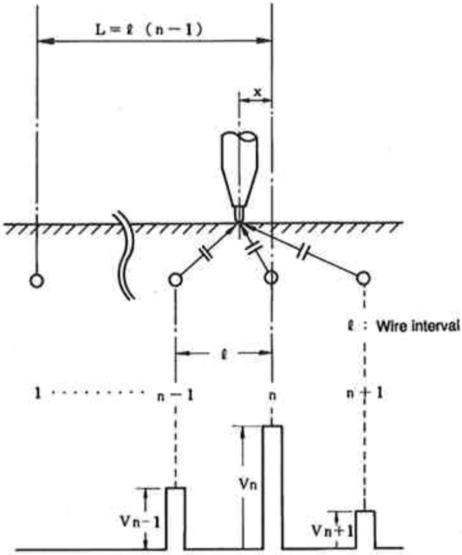

Amplification
Peak-hold
A/D conversion
V_{n-1}
V_n
V_{n+1}
Decoder X
Decoder Y
CPU
Controller PCB
Output (to copier)

Figure 3-801


L = ℓ (n−1)
x
ℓ : Wire interval
ℓ
1 .... n−1
n
n+1
Vn−1
Vn
Vn+1

Reference:

Pulses are applied to the electrode wires in sequence (1, ..., n–1, n, n+1).

⇩

At nth electrode wire, the maximum value Vn
∴ L : ℓ (n–1)
ℓ : wire interval

⇩

Obtains
Vn–(Vn–1)
Vn–(Vn+1) = S
then, computes x from the data table.

⇩

Obtains
⊕ when between n+1
⊖ when between n–1

Figure 3-802

C. Zero-Adjustment of the Input Coordinates

You must set the DIP switch on the controller PCB according to the label attached to the cable of the tablet (Figure 3-803, -804) whenever you have replaced the tablet or the control PCB inside the editor.

Execute 'EDADJ-X, -Y' in service mode if you note any discrepancy in the input coordinates after having made the settings.

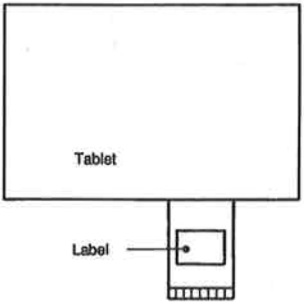
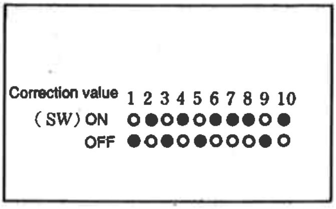


Figure 3-803



Correction value	1	2	3	4	5	6	7	8	9	10
(SW) ON	○	●	○	●	○	●	●	●	○	●
OFF	●	○	●	○	●	○	○	○	●	○

Figure 3-804 Display Sample (●: setting)

- **MEMO**

IX. FANS

The copier is equipped with 14 fans to discharge ozone, draw stray toner, and cool the machine.

Figure 3-901 shows the locations of these fans; Table 3-901 shows the function, filters used, and orientation of each fan. Figure 3-902 shows when each of the fans turns on.

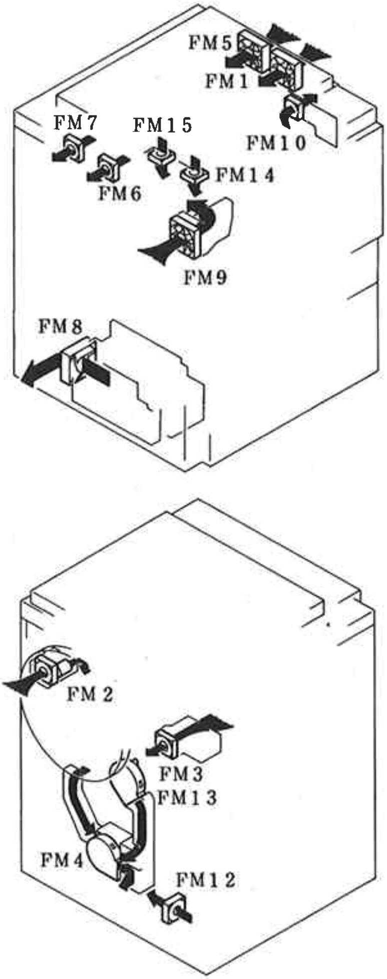

FM5
FM1
FM7
FM15
FM10
FM14
FM6
FM9
FM8
FM2
FM3
FM13
FM4
FM12

Figure 3-901

Notation	Name	Orientation	Filter	Function
FM1	Scanner system cooling fan1	Blow	Air	Prevents overheating of the CCD and copyboard glass by the scanning lamp.
FM2	Primary corona assembly fan (big, small)	Blow	Air	Blows air against the primary corona assembly to prevent collection of toner.
FM3	Fixing assembly heat exhaust fan	Suction	Ozone	Discharges heated air from around the fixing assembly to the outside of the machine.
FM4	Ozone exhaust fan 1	Suction	Ozone Air	Draws toner and ozone from the developing assembly duct and discharges it to the outside of the machine.
FM5	Scanning system cooling fan 2	Blow	Air	Prevents overheating of the CCD and copyboard glass by the scanning lamp.
FM6	Scanning system cooling fan 3	Suction	None	Prevents overheating of the CCD and copyboard glass by the scanning lamp.
FM7	Scanning system cooling fan 4	Suction	None	Prevents overheating of the CCD and copyboard glass by the scanning lamp.
FM8	Power supply cooling fan	Suction	None	Prevents overheating of the DC power supply 1.
FM9	IP cooling fan	Blow	None	Prevents overheating of the IP PCB.
FM10	Electrical equipment cooing fan 1	Blow	None	Cools the electrical equipment.
FM12	Developing bias power supply PCB cooling fan	Blow	None	Blows air against the developing bias power supply PCB to prevent overheating.
FM13	Ozone exhaust fan 2	Suction	Ozone Air	Draws toner and ozone from the developing assembly duct and discharges it to the outside of the machine.
FM14	Feeding fan 1	Blow	None	Keeps paper separated from the transfer drum (particularly curled paper) against the feeding belt to ensure proper feeding.
FM15	Feeding fan 2	Blow	None	Keeps paper separated from the transfer drum (particularly curled paper) against the feeding belt to ensure proper feeding.

Table 3-901

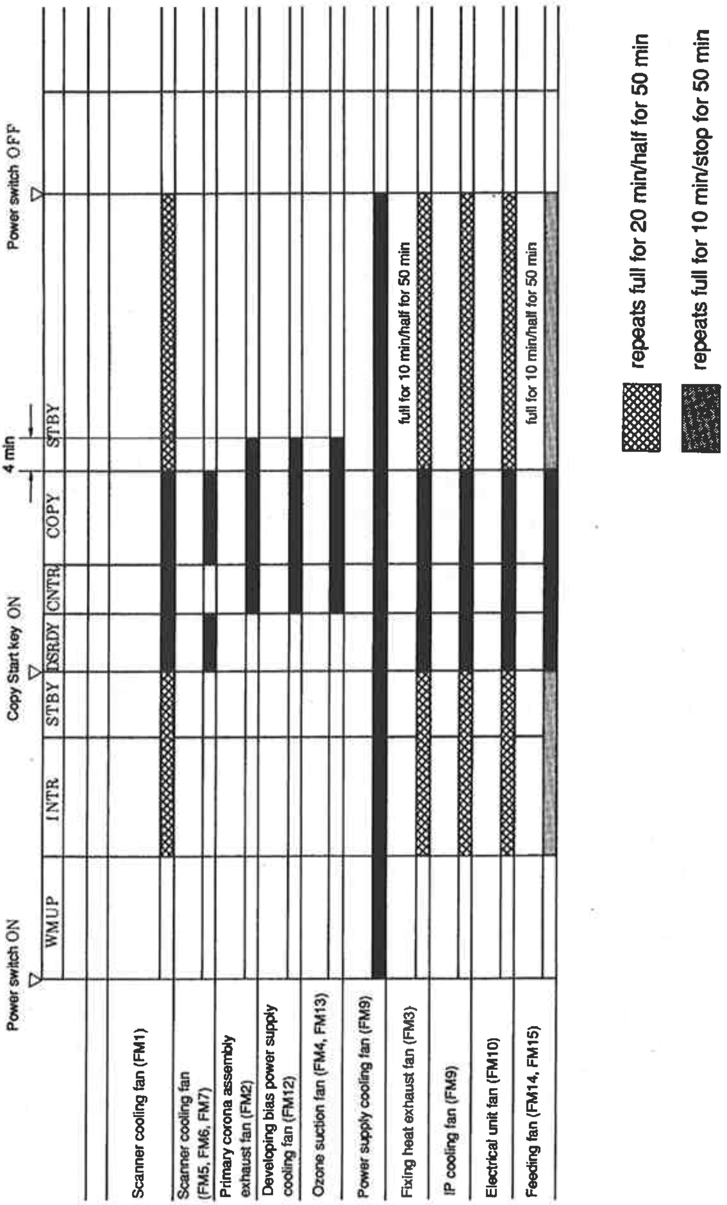

Power switch ON
WMUP
INTR
STBY
Copy Start key ON
DSRDY
CNTR
COPY
4 min
STBY
Power switch OFF
Scanner cooling fan (FM1)
Scanner cooling fan (FM5, FM6, FM7)
Primary corona assembly exhaust fan (FM2)
Developing bias power supply cooling fan (FM12)
Ozone suction fan (FM4, FM13)
Power supply cooling fan (FM9)
Fixing heat exhaust fan (FM3)
IP cooling fan (FM9)
Electrical unit fan (FM10)
Feeding fan (FM14, FM15)
full for 10 min/half for 50 min
full for 10 min/half for 50 min
repeats full for 20 min/half for 50 min
repeats full for 10 min/stop for 50 min

Figure 3-902

X. POWER SUPPLY

A. Power Supply

Figures 3-1001 and -1002 show the distribution of power among the copier's power supplies.

The AC power supplied to the main power supply is turned on and off by the main switch (SW1).

When AC power is supplied to the power supply PCB (DCP1), the PCB generates +27 V, +24 V, +24 Vf, +15 V, +8 V (two channels, for loads and for analog), +5V, and –8 V.

The energy saving switch (SW10) serves to keep the cassette heaters and the like on at all times by the setting of the switch; see Figure 3-113.

Table 3-1001 shows the cassette heaters and others that are turned on by the energy saving switch and main switch.

Since turning off the main switch cuts off DC power to the DC controller circuit and reader unit controller circuit, the copier is equipped with a lithium battery for backing up the RAMs on the PCBs.

B. Protection Mechanisms of the Power Supply Circuit

The main power supply PCB and options PCB are equipped with an overcurrent detecting circuit, which triggers protective mechanisms to cut out the output should a short circuit occur for some reason.

To reset the machine in response to the activation of the protection mechanism, turn off the power switch, disconnect the power plug, remove the cause of activation, and switch the power again; the protection circuit may be reset by keeping the AC power supply of the main power supply PCB off for about 30 sec and turning on the AC power again.

Power saving switch (SW10)	Main switch (SW1)	Drum heater (H4)	Duplexing stacking assembly heater (H3)	Upper cassette/ Lower cassette heater (H5, H6)
Normal position (right)	ON	ON	ON	ON
Normal position (right)	OFF	ON	OFF	ON
Power saving position (left)	ON	ON	ON	ON
Power saving position (left)	OFF	OFF	OFF	OFF

Note: At time of shipment, the power saving switch is set to normal position (right).

Table 3-1001

⚠ **CAUTION:**
Replace the lithium battery only with the one listed in the Parts Catalog. Use of a different battery may present a risk of fire or explosion. The battery may present a fire on chemical burn hazard if mistrated. Do not recharge, disassemble or dispose of it in fire.
Keep the battery out of reach of children and discard any used battery promptly.

Note:
If both upper and lower fixing heaters are on, the drum heater off signal is sent by the DC controller PCB to SSR2, thereby cutting off the power output to the drum heater and cassette heater.

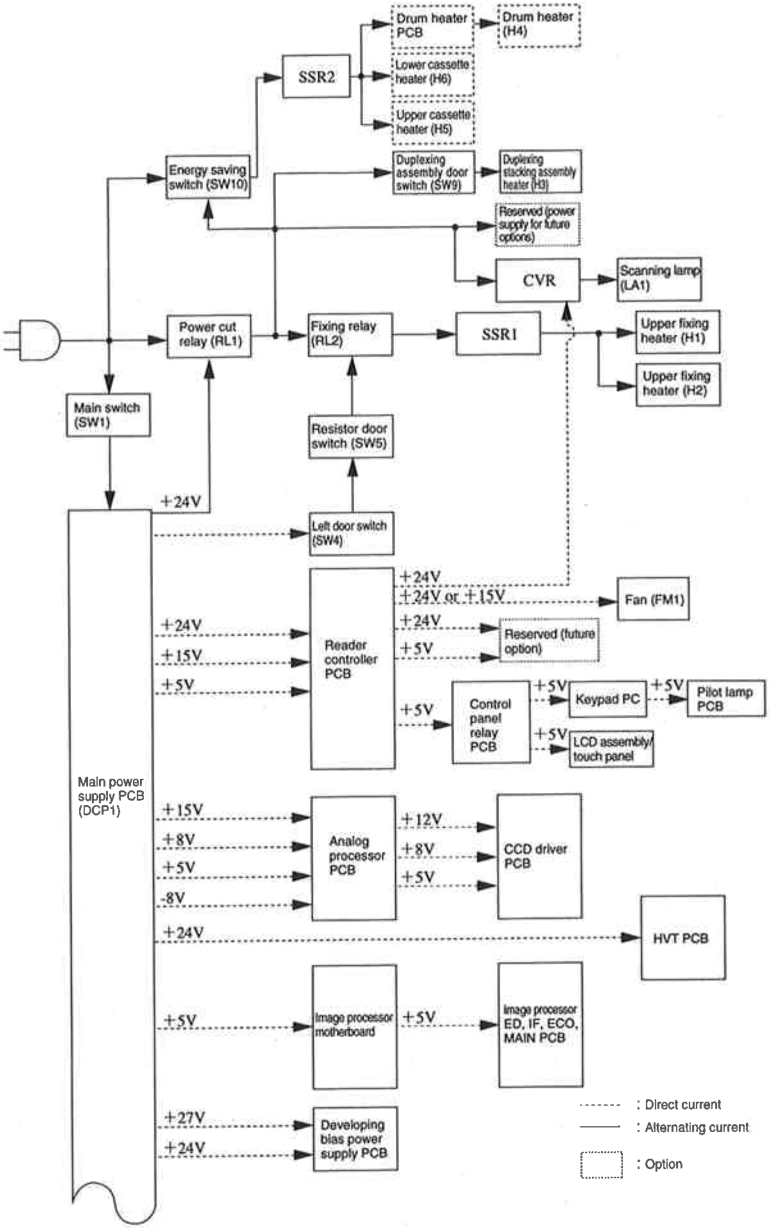

Drum heater PCB
Drum heater (H4)
SSR2
Lower cassette heater (H6)
Upper cassette heater (H5)
Energy saving switch (SW10)
Duplexing assembly door switch (SW9)
Duplexing stacking assembly heater (H3)
Reserved (power supply for future options)
CVR
Scanning lamp (LA1)
Power cut relay (RL1)
Fixing relay (RL2)
SSR1
Upper fixing heater (H1)
Upper fixing heater (H2)
Main switch (SW1)
Resistor door switch (SW5)
+24V
Left door switch (SW4)
+24V
+24V or +15V
Fan (FM1)
+24V
Reserved (future option)
+5V
+24V
+15V
+5V
Reader controller PCB
+5V
Control panel relay PCB
+5V
Keypad PC
+5V
Pilot lamp PCB
+5V
LCD assembly/ touch panel
Main power supply PCB (DCP1)
+15V
+8V
+5V
-8V
Analog processor PCB
+12V
+8V
+5V
CCD driver PCB
+24V
HVT PCB
+5V
Image processor motherboard
+5V
Image processor ED, IF, ECO, MAIN PCB
+27V
+24V
Developing bias power supply PCB
------- : Direct current
: Alternating current
: Option

Figure 3-1001

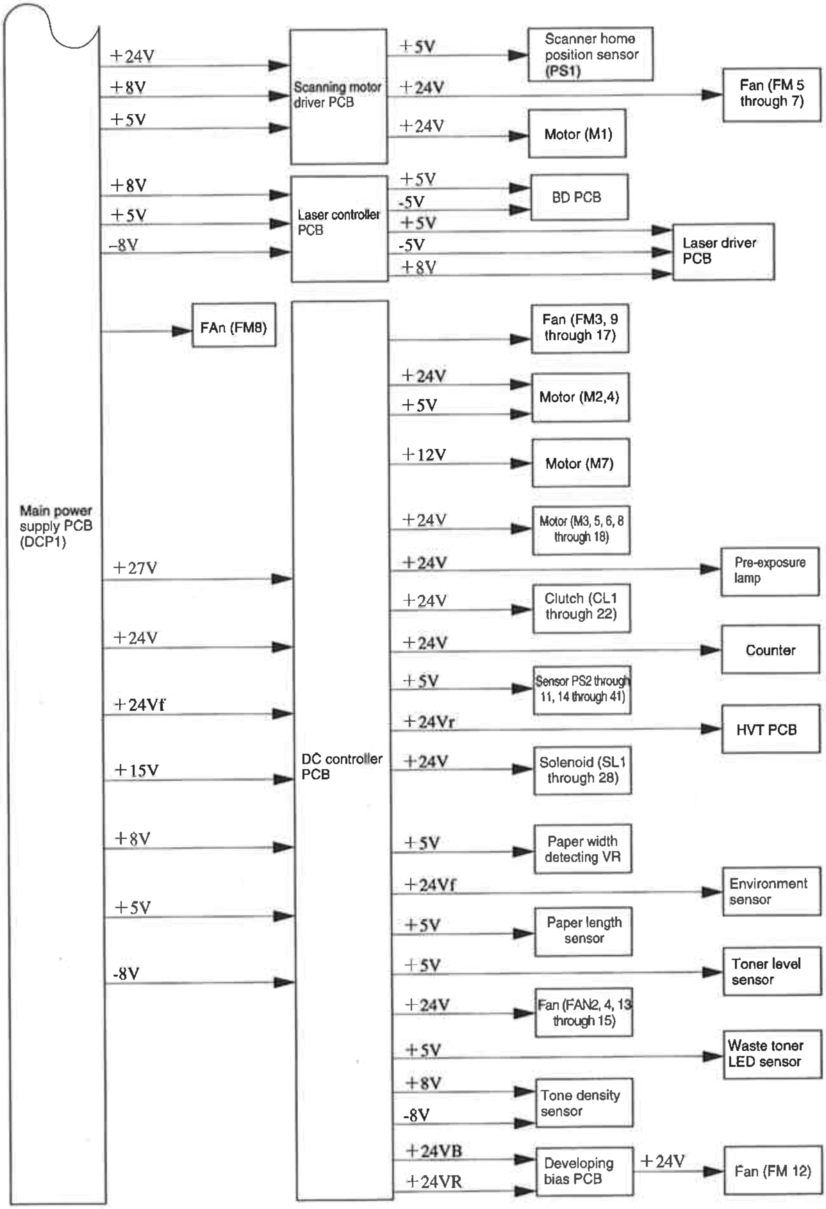

Main power supply PCB (DCP1)
+24V
+8V
+5V
Scanning motor driver PCB
+5V
Scanner home position sensor (PS1)
+24V
Fan (FM 5 through 7)
+24V
Motor (M1)
+8V
+5V
-8V
Laser controller PCB
+5V
-5V
BD PCB
+5V
-5V
+8V
Laser driver PCB
FAn (FM8)
Fan (FM3, 9 through 17)
+24V
+5V
Motor (M2,4)
+12V
Motor (M7)
+24V
Motor (M3, 5, 6, 8 through 18)
+27V
+24V
Pre-exposure lamp
+24V
Clutch (CL1 through 22)
+24V
+24V
Counter
+5V
Sensor PS2 through 11, 14 through 41)
+24Vf
+24Vr
HVT PCB
+15V
DC controller PCB
+24V
Solenoid (SL1 through 28)
+8V
+5V
Paper width detecting VR
+24Vf
Environment sensor
+5V
+5V
Paper length sensor
-8V
+5V
Toner level sensor
+24V
Fan (FAN2, 4, 13 through 15)
+5V
Waste toner LED sensor
+8V
-8V
Tone density sensor
+24VB
+24VR
Developing bias PCB
+24V
Fan (FM 12)

Figure 3-1002

XI. SERVICE MODE

A. Outline

The copier's service mode can be classified into the six modes shown in Table 3-1101.

No.	Notation	Description
1	DISPLAY	Control display mode
2	ADJUST	Adjustment mode
3	FUNC	Function mode
4	OPTION	Settings mode
5	TEST	Test print mode
6	COUNTER	Counter mode

Table 3-1101

1. Activating Service Mode and Making Selections

- You cannot activate service mode while the copier is making copies.

1) Press the ∗ key on the control panel.
2) Press the 2 and 8 keys on the keypad at the same time.
3) Press the ∗ key.
   - The screen shown in Figure 3-1101 appears.
4) Select an item on the touch panel.
   - The appropriate screen appears.

2. Deactivating Service Mode

Press the Reset key.

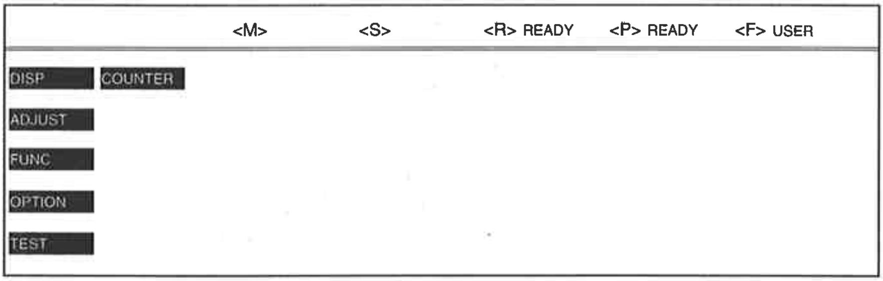


Figure 3-1101

3. RAM Backup

Figure 3-1102 depicts the label attached behind the reader controller cover and the DC controller cover.

Each machine is adjusted at the factory and the value is recorded on the label.

You must go through the following whenever you have replaced the reader controller PCB or the DC controller PCB or if you have replaced any ROMs on the PCBs or cleared the RAMs:

a After Replacing the DC Controller PCB

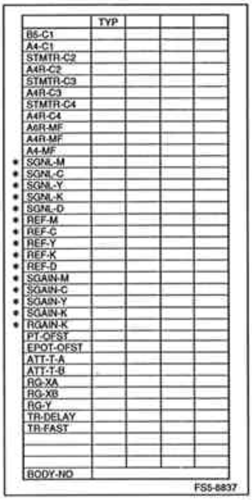
1) Replace the developer (for 4 colors), and execute 'STIR-4' and 'INIT-4' in service mode (FUNC→INSTALL).
2) Record the result (indicated by * in Figure 3-1102 (a)) on the service label; however, for "SGNL-K', record a value obtained by adding '37' to the result.
3) Enter the value recorded on the service label in service mode (FUNC→DC-CON; those not indicated by * in Figure 3-1102 (a)); however, for 'SGNL-K', re-enter the value you have recorded on the label.
4) When you have finished entering all values for each screen, press 'SEND'.
5) Set 'PASCAL' to '1' in service mode (ADJUST→PASCAL).
6) When you have entered all values, turn off and then on the power switch.

b After Clearing the RAM on the DC Controller PCB

1) Enter the value recorded on the service label in service mode (FUNC→DC-CON).
2) When you have entered all values on each screen, press 'SEND'.
3) Set 'PASCAL' to '1' in service mode (ADJUST→PASCAL).
4) When you have entered all values, turn off and then on the power switch.

c After Replacing the ROM on the DC Controller PCB

1) Execute 'RAM-CLR' in service mode (FUNC→DC-CON).
2) Go through the steps given under "After Clearing RAM on the DC Controller PCB".



		TYP			
	B5-C1				
	A4-C1				
	STMTR-C2				
	A4R-C2				
	STMTR-C3				
	A4R-C3				
	STMTR-C4				
	A4R-C4				
	A6R-MF				
	A4R-MF				
	A4-MF				
•	SGNL-M				
•	SGNL-C				
•	SGNL-Y				
•	SGNL-K				
•	SGNL-D				
•	REF-M				
•	REF-C				
•	REF-Y				
•	REF-K				
•	REF-D				
•	SGAIN-M				
•	SGAIN-C				
•	SGAIN-Y				
•	SGAIN-K				
•	RGAIN-K				
	PT-OFST				
	EPOT-OFST				
	ATT-T-A				
	ATT-T-B				
	RG-XA				
	RG-XB				
	RG-Y				
	TR-DELAY				
	TR-FAST				
	BODY-NO				

F55-8837

Figure 3-1102 (a)

d After Clearing the RAM on the Reader Controller PCB

1) Enter the value recorded on the service label in service mode (FUNC→R-CON; indicated by * in Figure 3-1102 (b)).
2) Execute 'FUNC→CCD→AUTO-ADJ' in service mode, and record the result on the service label (indicated by * in Figure 3-1102 (b)).
3) If a projector is installed, execute 'PROJ-CCD' in service mode (FUNC→PRJ-ADJ).
4) When you have entered all values, turn off and then on the power switch.

e After Replacing the ROM on the Reader Controller PCB

1) Execute 'RAM-CLR' in service mode (FUNC→R-CON).
2) Go through the steps under "After Replacing the Reader Controller PCB or Clearing the RAM".

	TYP		
CVR-TYPE			
ADJ-X			
ADJ-Y			
ADJ-S			
ED-ADJ-X			
ED-ADJ-Y			
ADJ-J			
EC-GLASS			
DA-XS			
DA-XE			
DA-YS			
DA-YE			
DS-DOC			
DS-PRJ			
DS-OHP			
ADJ-M			
ADJ-C			
ADJ-Y			
ADJ-K			

		TYP		
	OFST-M			
	OFST-C			
	OFST-Y			
	OFST-K			
	SEG-ADJ			
	BC-ADJ			
	LGCR-IPU			
*	LAMP-DT			
*	GAIN-B			
*	GAIN-G			
*	GAIN-R			
*	TARGET-B			
*	TARGET-G			
*	TARGET-R			

Figure 3-1102 (b)

4. Using Service Mode

Items to Select

a. The items are grouped into 1st-level, 2nd-level, and 3rd-level items, and 1st-level items remain displayed while the machine is in service mode.
b. To select an item, press its text box (reverse video on blue background).

Display

<M>	Indicates a 2nd-level item that has been selected.
<S>	Indicates in terms of N/M (N being the current screen number, and M being the total number of screens).
<P>	Indicates the state of the printer. SERVICE : service operation JAM : paper jam DOOR : door open ERROR : service error COPYING : copying WAITING : initial rotation or the like READY : copying ready while in service operation
<R>	Indicates reader state BUSY : copying not ready while in service operation READY : copying ready while in service operation

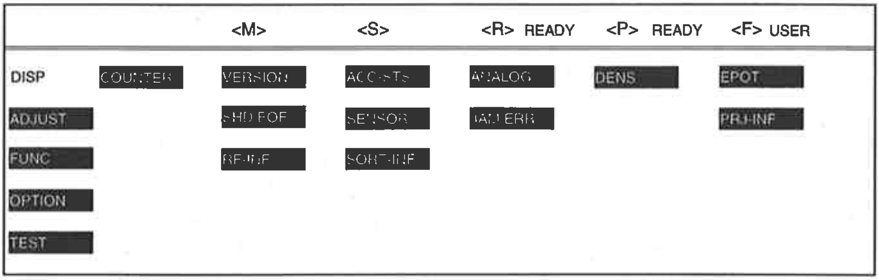
Keys

0 through 9	Enter 0 through 9 as when entering settings.
Reset	Press to end service mode (not valid at time of LCD-CHECK or KEY-CHECK)
Stop	Press to stop an operation.
Two-sided	Enter A(10) when entering settings in hexadecimal notation.
One-Touch Adjust	Enter B(11) when entering settings in hexadecimal notation.
Color Adjust	Enter C(12) when entering settings in hexadecimal notation.
Extended Zoom	Enter D(13) when entering settings in hexadecimal notation.
Frame Erase	Enter E(14) when entering settings in hexadecimal notation.
Color Create	Enter (F(15) when entering settings in hexadecimal notation.

Page Separate	Press for +100 in relation to the absolute value when entering settings.
Image Create	Press for –100 in relation to the absolute value when entering settings.
Marker	Press for +10 in relation to the absolute value when entering settings.
Synthesize	Press for –10 in relation to the absolute value when entering settings.
User Mode	Press for +1 in relation to the absolute value when entering settings.
OHP Interleaf	Press for –1 in relation to the absolute value when entering settings.

Start	Press to executing copying operation.
Pre-Heat	Press to switch between + and – when entering settings.
Interrupt	Press to move to the next 3rd-level screen when multiple 3rd-level screens exist.

B. Control Display Mode (DISPLAY)

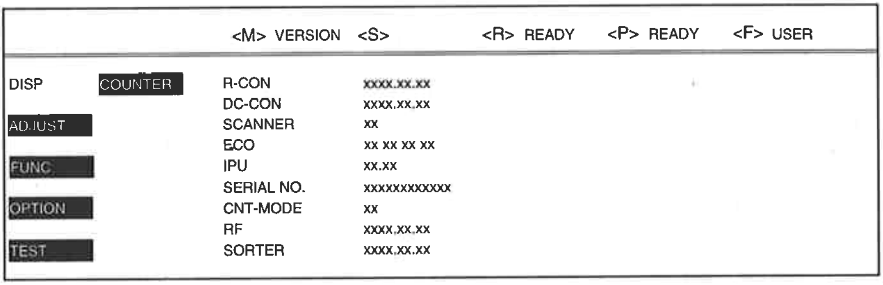


		<M>	<S>	<R> READY	<P> READY	<F> USER
DISP	COUNTER	VERSION	ACC-STS	ANALOG	DENS	EPOT
ADJUST		SHD/BOF	SENSOR	JAM/ERR		PRJ-INF
FUNC		RF-INF	SORT-INF			
OPTION						
TEST						

1	VERSION	Indicates the ROM version.
2	ACC-STS	Indicates the state of the option.
3	ANALOG	Indicates the analog sensor measurements.
4	DENS	Developer density.
5	EPOT	Photosensitive drum surface potential control data.
6	SHD/BOF	Shading/Black Offset Data
7	SENSOR	Sensor/DC controller input port.
8	JAM/ERR	Indicates jam/error.
9*	PRJ-INF	Indicates the state of the projector.
10*	RF-INF	Indicates the state of the RDF.
11*	SORT-INF	Indicates the state of the sorter.

*Not indicated if the relevant option is not installed.

1. ROM Version Display

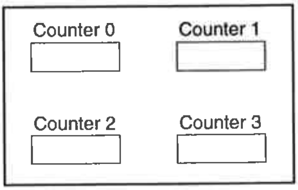


```
                         <M> VERSION  <S>          <R> READY    <P> READY    <F> USER

DISP       COUNTER       R-CON          xxxx.xx.xx
                         DC-CON         xxxx.xx.xx
ADJUST                   SCANNER        xx
                         ECO            xx xx xx xx
FUNC                     IPU            xx.xx
                         SERIAL NO.     xxxxxxxxxxxx
OPTION                   CNT-MODE       xx
                         RF             xxxx.xx.xx
TEST                     SORTER         xxxx.xx.xx
```

Item	Description	Remarks
R-CON	Indicates the version of the ROM (Q605, Q616, Q617, Q901) of the reader controller PCB.	XXXX . XX . XX R&D control number ROM version number Language number
DC-CON	Indicates the version of the ROM (IC104) on the DC controller PCB.	
SCANNER	Indicates the version of the ROM (Q648) on the scanner driver PCB.	
ECO	Indicates the versions of the four ROMs on the IP-ECO PCB.	
IPU	Indicates the version of the ROM on the IPU.	
SERIAL No.	Indicates the serial number	For factory.
CNT-MODE	Indicates the type of control of the copy counter; see the next table.	
RF	Indicates the version of the ROM on the RF controller PCB.	XXXX . XX . XX R&D control number ROM version number Language number
SORTER	Indicates the version of the ROM on the sorter controller PCB.	

CNT-MODE in Detail

Counter Control	Counter 0	Counter 1	Counter 2	Counter 3
A	Total copy counter	BK copy counter	Color copy counter	Color printer counter
B	Total copy counter	BK copy counter	Large size color copy counter	Small size color copy counter
C	Total copy counter	Bk copy counter	Color copy counter	
D	Mono copy counter	Bk copy counter	Large size color copy counter	Small size color copy counter
E	Total copy counter	Bk copy counter	Color copy counter (excluds mono copies)	

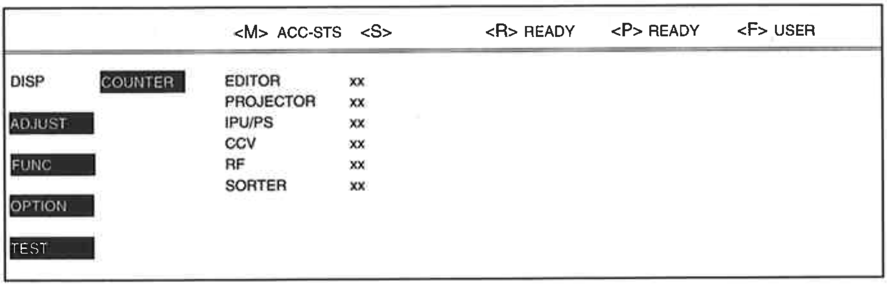


Counter Control	Product Code	
	(TYPE 1)	(TYPE 2)
A	F13-1111/1211	F13-1112/1212
B	F13-1131/1231 F13-1191/1291 F13-1101/1201	F13-1132/1232 F13-1192/1292 F13-1102/1202
C	F13-1151/1251 F13-1161/1261 F13-1181/1281	F13-1152/1252 F13-1162/1262 F13-1182/1282
D	F13-1141/1241	F13-1142/1242 F13-1122
E	F13-1171/1271	F13-1172/1272

Language Number in Detail

	X4	X3	X2	X1
DC controller PCB	0	0	0	0
Reader controller PCB	0	1	1: Japanese 2: English 3: French 4: German 5: Danish 6: Dutch 7: Finish 8: Italian 9: Norwegian A: Portuguese B: Spanish C: Swedish	0: AB 1: Inch 2: A 3: all

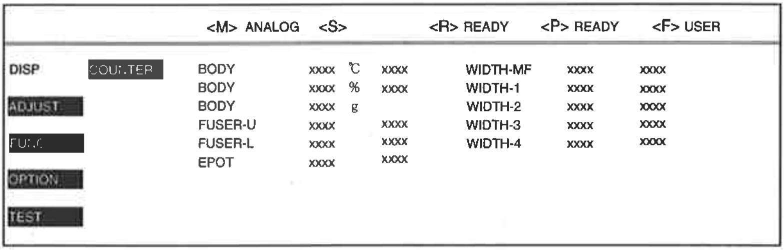
2. Option State Display



```
                    <M> ACC-STS   <S>          <R> READY     <P> READY     <F> USER

DISP      COUNTER   EDITOR        xx
                    PROJECTOR     xx
ADJUST              IPU/PS        xx
                    CCV           xx
FUNC                RF            xx
                    SORTER        xx
OPTION

TEST
```

Item	Description
EDITOR	Indicates the connection of the editor. EDITOR=0 : Editor absent; however, I/F PCB present. 1 : Editor present. 2,4 : Editor absent; however, memory error present. 3,5 : Editor present; however, memory error present. 6 : Editor absent. I/F PCB absent, or memory error present. 7 : Editor present. I/F PCB absent, or memory error present.
PROJECTOR	Indicates the connection of the projector. PROJECTOR=0 : Projector absent; however, I/F PCB present. 1 : Projector present. 2 : Projector absent. I/F PCB absent, or memory error present. 3 : Projector present; however, memory error present.
IPU/IPS	Indicates the connection of the IPU/PS-IPU. IPU/PS= 0 : I/F PCB absent. 1 : I/F PCB only present. 2 : PS-IPU present. 3 : PS-IPU, extension board present. 4 : IPU present. 5 : PS-IPU, IPU, extension board present.
CCV	Indicates the connection of the control card V. CCV=0 : CCV disable. 1 : CCV enable.
RF	Indicates the state of connection of the RDF. RF=0: absent. RF=1: present.
SORTER	Indicates the state of connection of the sorter. SORTER=0: absent. 1: Sorter-D1 3: Stapler Sorter-F1 5: Sorter-D1+Buffer Pass Unit 1 7: Stapler Sorter-F1 + Buffer Pass Unit 1

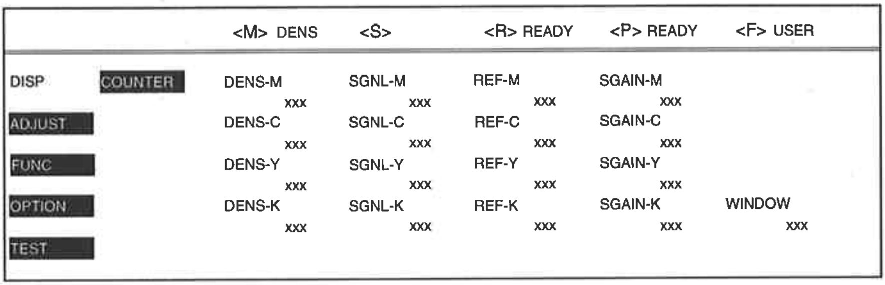
3. Analog Sensor Measurements Display



```
                    <M> ANALOG   <S>           <R> READY    <P> READY    <F> USER

DISP     COUNTER    BODY      xxxx  ℃  xxxx      WIDTH-MF     xxxx       xxxx
                    BODY      xxxx  %  xxxx      WIDTH-1      xxxx       xxxx
ADJUST              BODY      xxxx  g            WIDTH-2      xxxx       xxxx
                    FUSER-U   xxxx     xxxx      WIDTH-3      xxxx       xxxx
FUNC                FUSER-L   xxxx     xxxx      WIDTH-4      xxxx       xxxx
                    EPOT      xxxx     xxxx
OPTION

TEST
```

Item	Description
BODY	Indicates the machine inside temperature. BODY XXX°C XXX Environment sensor output value (0 through 1023) Environment sensor output conversion value (°C)
BODY	Indicates the machine inside humidity measured by the environment sensor. BODY XXX% XXX Environment sensor output value (0 through 1023) Environment sensor output conversion value (%)
BODY	Indicates the machine inside humidity absolute value measured by the environment sensor (g). BODY XX XXg ↑ Decimal point Ex) 0750g = 7.50g
FUSER-U	Indicates the upper fixing roller temperature (output of thermistor THM1). FUSER-U XXX XXX Output value of THM1 (0 to 1023) Output conversion value of THM1 (°C)
FUSER-L	Indicates the upper fixing roller temperature (output of thermistor THM2). FUSER-L XXX XXX Output value of THM2 (0 to 1023) Output conversion value of THM2 (°C)
EPOT	Indicates the drum surface potential measured by the potential sensor . EPOT XXX XXX Output value of the potential sensor (0 through 1023) Output conversion value of the potential sensor (V)
WIDTH-MF WIDTH-1 WIDTH-2 WIDTH-3 WIDTH-4	Indicates the paper width conversion value (mm) of each cassette and multifeeder. WIDTH-2 XXXX XXXX Output value Replacement value (mm)

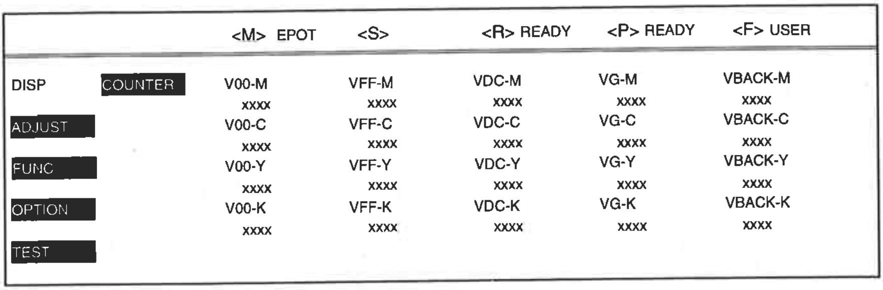
4. Developer Density Display



```
                        <M> DENS     <S>           <R> READY     <P> READY     <F> USER

DISP      COUNTER       DENS-M       SGNL-M        REF-M         SGAIN-M
                              xxx          xxx           xxx           xxx
ADJUST                  DENS-C       SGNL-C        REF-C         SGAIN-C
                              xxx          xxx           xxx           xxx
FUNC                    DENS-Y       SGNL-Y        REF-Y         SGAIN-Y
                              xxx          xxx           xxx           xxx
OPTION                  DENS-K       SGNL-K        REF-K         SGAIN-K       WINDOW
                              xxx          xxx           xxx           xxx           xxx
TEST
```

Item	Description	Remarks
DENS-M DENS-C DENS-Y DENS-K	Indicates the density of the developer of each color inside the developing assembly. + : higher than the target value. – : lower than the target value. SGNL and REF stored in 'ATR-INIT' and value computed by SGNL and REF on the screen.	Unit: 0.1%
SGNL-M SGNL-C SGNL-Y SGNL-K	Indicates the measurement (AD conversion value) of the current developer density of each color.	Measured for each copy.
REF-M REF-C REF-Y REF-K	Indicates the measurement (AD conversion value) of the reference signal of each color.	Measured for each copy.
SGAIN-M SGAIN-C SGAIN-Y SGAIN-K	Indicates the gain signal (initial value) of each color (AD conversion value).	
WINDOW	Indicates the correction coefficient of soiling of the window. The value decreases as the window of the black toner density sensor becomes soiled.	Standard: 100% Normal if between 76 and 124.

5. Photosensitive Drum Surface Potential Control Data

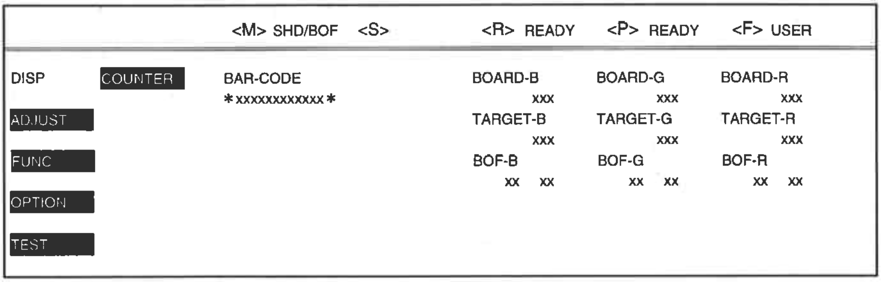


```
                         <M>  EPOT     <S>          <R> READY     <P> READY     <F> USER

DISP       COUNTER       V00-M         VFF-M        VDC-M         VG-M          VBACK-M
                           xxxx          xxxx         xxxx          xxxx          xxxx
ADJUST                   V00-C         VFF-C        VDC-C         VG-C          VBACK-C
                           xxxx          xxxx         xxxx          xxxx          xxxx
FUNC                     V00-Y         VFF-Y        VDC-Y         VG-Y          VBACK-Y
                           xxxx          xxxx         xxxx          xxxx          xxxx
OPTION                   V00-K         VFF-K        VDC-K         VG-K          VBACK-K
                           xxxx          xxxx         xxxx          xxxx          xxxx
TEST
```

Item	Description	Remarks
VOO=M VOO=C VOO=Y VOO=K	Indicates the target value of V_D (when laser output is 00).	Unit: V
VFF=M VFF=C VFF=Y VFF=K	Indicates the target value of V_L (when laser output is ff).	Unit: V
VDC=M VDC=C VDC=Y VDC=K	Indicates the target value of Vdc (developing bias DC component).	Unit: V
VG=M VG=C VG=Y VG=K	Indicates the target value of Vg (grid bias).	Unit: V
VBACK=M VBACK=C VBACK=Y VBACK=K	Indicates the de-fogging potential setting.	–7 ~ 7

- The measurements of V00 and VFF may be checked by 'EPC' under 'FUNC'.

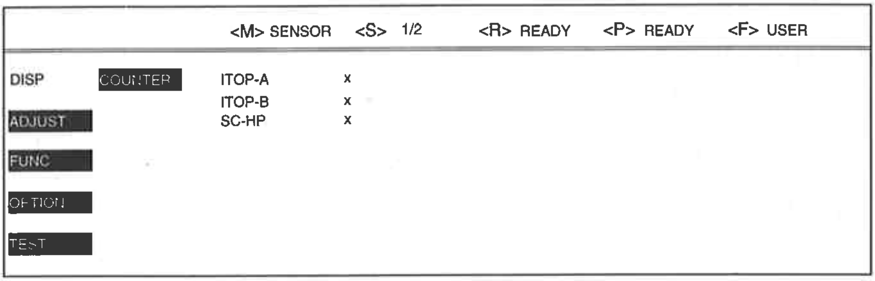
6. Shading/Black Offset Data



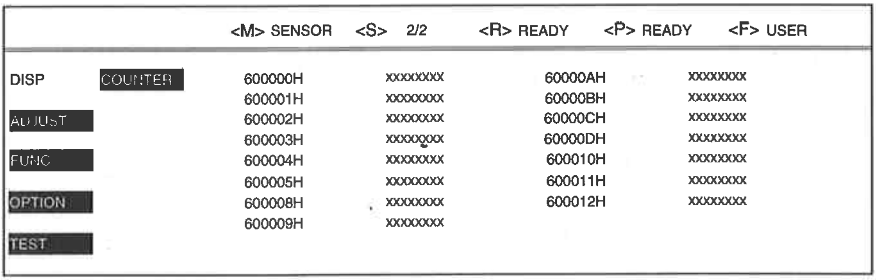
```
                      <M> SHD/BOF   <S>           <R> READY    <P> READY    <F> USER

DISP      COUNTER     BAR-CODE                    BOARD-B      BOARD-G      BOARD-R
                      *xxxxxxxxxxxx*                   xxx          xxx          xxx
ADJUST                                            TARGET-B     TARGET-G     TARGET-R
                                                       xxx          xxx          xxx
FUNC                                              BOF-B        BOF-G        BOF-R
                                                     xx   xx      xx   xx      xx   xx
OPTION

TEST
```

Item	Description	Remarks
BAR-CODE	Indicates the bar-code setting of the standard white plate.	Indicated only after executing 'AUTO-ADJ' of 'CCD' under 'FUNC'. (not indicated by turning the power off and then on)
BOARD-B BOARD-G BOARD-R	Indicates the output of each CCD when the the standard white plate is read. (output after A/D conversion)	
TARGET-B TARGET-G TARGET-R	Indicates the shading target value.	
BOF-B BOF-G BOF-R	Indicates the output of each CCD when the scanning lamp is off. odd bit/even bit	

7. Sensor/DC Controller Input Port



```
                    <M> SENSOR   <S>  1/2      <R> READY    <P> READY    <F> USER

DISP      COUNTER   ITOP-A        x
                    ITOP-B        x
ADJUST              SC-HP         x

FUNC

OPTION

TEST
```



```
                    <M> SENSOR   <S>  2/2      <R> READY    <P> READY    <F> USER

DISP      COUNTER     600000H       xxxxxxxx        60000AH       xxxxxxxx
                      600001H       xxxxxxxx        60000BH       xxxxxxxx
ADJUST                600002H       xxxxxxxx        60000CH       xxxxxxxx
                      600003H       xxxxxxxx        60000DH       xxxxxxxx
FUNC                  600004H       xxxxxxxx        600010H       xxxxxxxx
                      600005H       xxxxxxxx        600011H       xxxxxxxx
OPTION                600008H       xxxxxxxx        600012H       xxxxxxxx
                      600009H       xxxxxxxx
TEST
```

Item	Description	Remarks
ITOP-A	Indicates the output of side A sensor (PS2).	When PS2 is detecting the transfer drum.
ITOP-B	Indicates the output of the side B sensor (PS3).	When PS3 is detecting the transfer drum.
SC-HP	Indicate the output of the scanner home position sensor (PS1).	When the scanner is at home position.
600000 to 600012H	Indicates the input port of the DC controller PCB (600000H through 600012H).	

NO1

Address		Item	Description	Remarks
600000H	7	PS43D	Pre-phtosensitive drum cleaner paper sensor (PS43; TYPE 2 only)	Paper present: 1
	6	—	For future use.	—
	5		Buffer pass unit inlet paper sensor	Paper present: 1
	4		Buffer pass unit locking cam sensor	At HP: 1
	3	DLVRY–0	External delivery sensor (PS27)	Paper present: 0
	2	DLVRY_1	Internal delivery sensor (PS11)	Paper present: 1
	1	SPRT	Separation sensor (PS6)	Paper present: 1
	0	TRANS_2	Post-transfer paper sensor (PS5)	Paper present: 1
600001H	7	TRANS_1	Pre-transfer paper sensor (PS4)	Paper present: 1
	6	RGST	Registration paper sensor (PS41)	Paper present: 1
	5	OHP	OHP sensor (PS40)	Paper present: 1
	4	MFPPD	Multifeeder pick-up sensor (PS8)	Paper present: 1
	3	PS19D	Pick-up vertical path 1A sensor (PS19; CLC700)	Paper present: 1
	2	PS26D	Pick-up vertical path 1B sensor (PS26; CLC800)	Paper present: 1
	1	PS24D	Pick-up vertical path 2 sensor (PS24; CLC800)	Paper present: 1
	0	PS25D	Pick-up vertical path 3 sensor (PS25; CLC800)	Paper present: 1
600002H	7	—	For future use.	—
	6	—	For future use.	—
	5	MFPD	Multifeeder paper sensor (PS14)	Paper present: 0
	4	DUP_PD	Duplexing unit stacking assembly paper sensor (PS32; CLC800)	Paper present: 0
	3	C4PD	Cassette 4 paper sensor (PS23; CLC800)	Paper present: 1
	2	C3PD	Cassette 3 paper sensor (PS22; CLC800)	Paper present: 1
	1	C2PD	Cassette 2 paper sensor (PS18; CLC700)	Paper present: 1
	0	C1PD	Cassette 1 paper sensor (PS16)	Paper present: 1

NO2

Address		Item	Description	Remarks
600003H	7	—	For future use.	—
	6	—	For future use.	—
	5	PS33D	Duplexing unit feeding assembly paper sensor (PS33; CLC800)	Paper present: 0
	4	PS31D	Duplexing unit reversing assembly outlet paper sensor (PS31; CLC800)	Paper present: 0
	3	PS30D	Duplexing unit post-reversal paper sensor (PS30; CLC800)	Paper present: 1
	2	PS29D	Duplexing unit pre-reversal paper sensor (PS29; CLC800)	Paper present: 1
	1	PS39D	Delivery vertical path 2 sensor (PS39; CLC800)	Paper present: 1
	0	PS28D	Delivery path 1 sensor (PS28; CLC800)	Paper present: 1
600004H	7	—	For future use.	—
	6	—	For future use.	—
	5	M6RDY	Pick-up motor READY	READY: 0
	4	—	For future use.	—
	3	LSMRDY	Scanning motor READY	READY: 0
	2	FXMRDY	Fixing motor READY	READY: 0
	1	DRMRDY	Drum motor READY	READY: 0
	0	MMRDY	Main motor READY	READY: 0
600005H	7	—	—	—
	6	—	—	—
	5	—	—	—
	4	—	—	—
	3	—	—	—
	2	—	—	—
	1	—	—	—
	0	—	—	—

NO3

Address		Item	Description	Remarks
600008H	7		Pre-phtosensitive drum cleaner paper sensor (PS43) presence / absence	Present: 1
	6	—	For future use.	—
	5	—	For future use.	—
	4	—	Presence / absence of buffer	Present: 1
	3	—	Transfer assembly frame door connector	Connected: 0
	2	—	Duplexing drawer connector	Connected: 0
	1	—	Transfer assembly drawer connector	Connected: 0
	0	—	Fixing assembly drawer connector	Connected: 0
600009H	7	—	For future use.	—
	6	—	For future use.	—
	5		Buffer door switch	Door open: 1
	4	REV_DR	Reversal door switch	Door open: 1
	3	FEED_DR	Feed door switch	Door open: 1
	2	LEFT_DR	Left door switch	Door open: 0
	1	RGHT_DR	Right door sensor	Door open: 0
	0	DEL_DR	Delivery door sensor	Door open: 0
60000AH	7	—	—	—
	6	—	—	—
	5	—	—	—
	4	—	—	—
	3	—	—	—
	2	—	—	—
	1	—	—	—
	0	—	—	—
60000BH	7	C4SZ1	Cassette 4 paper length sensor (CLC800)	PS106 ON: 1
	6	C4SZ0	Cassette 4 paper length sensor 0 (CLC800)	PS105 ON: 1
	5	C3SZ1	Cassette 3 paper length sensor 1 (CLC800)	PS104 ON: 1
	4	C3SZ0	Cassette 3 paper length sensor 0 (CLC800)	PS103 ON: 1
	3	C2SZ1	Cassette 2 paper length sensor 1 (CLC700)	PS102 ON: 1
	2	C2SZ0	Cassette 2 paper length sensor 0 (CLC700)	PS101 ON: 1
	1	—	—	—
	0	—	—	—

NO4

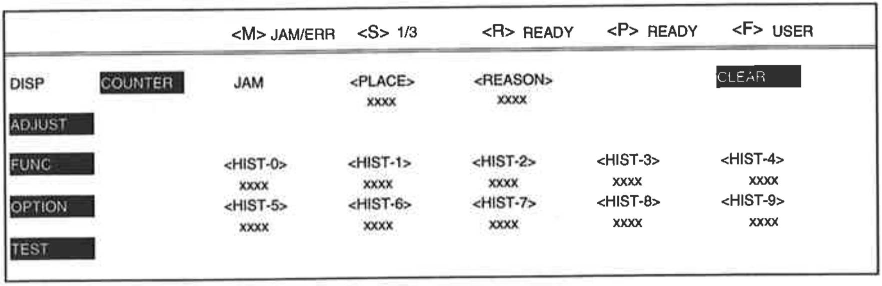
Address		Item	Description	Remarks
60000CH	7	WTBD	Delivery toner feeding screw lock detection switch (MS4)	Screw lock: 0
	6	WTONER	Waste toner full sensor (PS42)	Waste toner full: 1
	5	WEBD	Fixing cleaning belt level sensor (PS10)	Belt absent: 1
	4	OILEP	Fixing oil level sensor (PS9)	Oil absent: 0
	3	BKTEP	Bk toner level sensor (TS4)	Low: 0
	2	YTEP	Y toner level sensor (TS3)	Low: 0
	1	CTEP	C toner level sensor (TS2)	Low: 0
	0	MTEP	M toner level sensor (TS1)	Low: 0
60000DH	7	—	Polishing roller drive motor overcurrent detection	Overcurrent: 1
	6	—	Cleaning assembly reciprocating motor overcurrent	Overcurrent: 0
	5	—	Hopper motor overcurrent detection	Overcurrent: 0
	4	—	Transfer drum cleaner motor overcurrent detection	Overcurrent: 0
	3	—	Brush drive motor cover current detection	Overcurrent: 1
	2	—	For future use.	—
	1	—	—	—
	0	—	—	—
600010H	7	C4LFU	Cassette 4 lifter sensor (PS21; CLC800)	Lifter up: 1
	6	C3LFU	Cassette 3 lifter sensor (PS20; CLC800)	Lifter up: 1
	5	C2LFU	Cassette 2 lifter sensor (PS17; CLC700)	Lifter up: 1
	4	C1LFU	Cassette 1 lifter sensor (PS15)	Lifter up: 1
	3	PGHP	Paper jogging guide home position sensor (PS34; CLC700)	At HP: 1
	2	BMTRHP	Brush drive motor home position sensor (PS7)	At HP: 1
	1	A-LEG	A sensor (PS2)	On side A: 1
	0	B-LEG	Side B sensor (PS3)	On side B: 1

NO5

Address		Item	Description	Remarks
600011H	7	—	Fixing heater error low	Error: 1
	6	—	Fixing heater error up	Error: 1
	5	—	Shutoff error	Error: 1
	4	—	SSR1 error	Error: 1
	3	—	SSR2 error	Error: 1
	2	—	For future use.	—
	1	DRUMHP	Photosensitive drum home position sensor (PS38)	At HP: 1
	0	KEYSW	Key switch	Key switch on: 0
600012H	7	—	Counter mode 4	Counter up: 1
	6	—	Counter mode 3	Counter up: 1
	5	—	Counter mode 2	Counter up: 1
	4	—	Counter mode 1	Counter up: 1
	3	—	For future use.	—
	2	—	For future use.	—
	1	—	For future use.	—
	0	—	For future use.	—

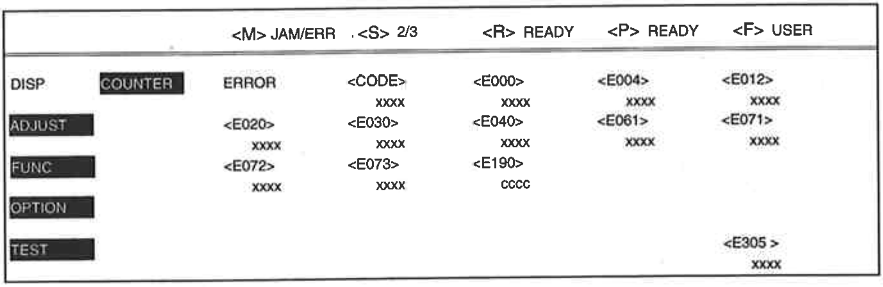
8. Jam/E Display

- 1st page (jam history)



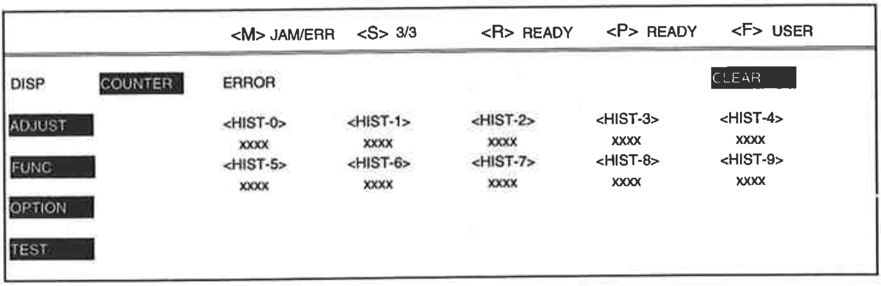
```
                      <M> JAM/ERR  <S> 1/3    <R> READY   <P> READY   <F> USER

DISP     COUNTER      JAM          <PLACE>    <REASON>                CLEAR
                                    xxxx       xxxx
ADJUST

FUNC                  <HIST-0>     <HIST-1>   <HIST-2>    <HIST-3>    <HIST-4>
                        xxxx        xxxx        xxxx        xxxx        xxxx
OPTION                <HIST-5>     <HIST-6>   <HIST-7>    <HIST-8>    <HIST-9>
                        xxxx        xxxx        xxxx        xxxx        xxxx
TEST
```

- 2nd page (E indication)



```
                      <M> JAM/ERR  <S> 2/3    <R> READY   <P> READY   <F> USER

DISP     COUNTER      ERROR        <CODE>     <E000>      <E004>      <E012>
                                     xxxx       xxxx        xxxx        xxxx
ADJUST                <E020>       <E030>     <E040>      <E061>      <E071>
                        xxxx         xxxx       xxxx        xxxx        xxxx
FUNC                  <E072>       <E073>     <E190>
                        xxxx         xxxx       cccc
OPTION

TEST                                                                  <E305 >
                                                                        xxxx
```

- 3rd page (E indication history)



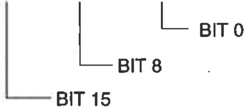
```
                      <M> JAM/ERR  <S> 3/3    <R> READY   <P> READY   <F> USER

DISP     COUNTER      ERROR                                           CLEAR

ADJUST                <HIST-0>     <HIST-1>   <HIST-2>    <HIST-3>    <HIST-4>
                        xxxx         xxxx       xxxx        xxxx        xxxx
FUNC                  <HIST-5>     <HIST-6>   <HIST-7>    <HIST-8>    <HIST-9>
                        xxxx         xxxx       xxxx        xxxx        xxxx
OPTION

TEST
```

Item	Description
<PLACE>	Indicates the location of a jam (paper position) in code.
<REASON>	Indicates the cause/location of a jam; see next page.
<CLEAR>	CLEAR on page 1/3 clears the jam history. CLEAR on page 3/3 clears the error code (E indication) history.
<HIST-0> to <HIST-9>	Indicates the history of jams (REASON). • HIST-0 represents the most recent jam detected.
<CODE>	Indicates the results of self diagnosis (E indication).
<E000> <E004> <E012> <E020> <E030> <E040> <E061> <E071> <E072> <E073> <E190> <E305>	Details of E000 Details of E004 Details of E012 Details of E020 Details of E030 Details of E040 Details of E061 Details of E071 Details of E072 Details of E073 Details of E190 Details of E305 See p. 3-292.
<HIST-0> to <HIST-9>	Indicates the history of error codes (E indication). • HIST-0 represents the most recent error indication.

PLACE Codes

The PLACE codes are expressed in hexadecimal notation. You may convert them into binary notation to identify the location of the jam.

- 00H = 0000000000000000



BIT	JAM Location
BIT 0 = 1	near cassette 1
BIT 1 = 1	near cassette 2
BIT 2 = 1	near cassette 3
BIT 3 = 1	near cassette 4
BIT 4 = 1	near multifeeder assembly
BIT 5 = 1	near duplexing unit
BIT 6 = 1	near pickup vertical path
BIT 7 = 1	near multifeeder feeding assembly
BIT 8 = 1	near pre-registration roller
BIT 9 = 1	near transfer drum
BIT 10 = 1	near separation assembly
BIT 11 = 1	near fixing assembly
BIT 12 = 1	near delivery vertical path
BIT 13 = 1	near duplexing tray
BIT 14 = 1	near buffer unit
BIT 15 = 1	near sorter

For instance, if 'JAM, PLACE=2100H', 2100H = 0010 0001 0000 0000 , pointing to a point between the duplexing tray assembly and the pre-registration roller.

REASON Codes

first 2 digits: jam Cause code	Jam
01xx	Delay jam
02xx	Stationary jam
03xx	Paper at time of power-on or opening/closing of front/ pick-up assembly/delivery assembly door
04xx	Wrong point of attraction jam
05xx	Sorter jam
FFxx	Opening of front/pick-up assembly/delivery assembly door during copying assembly

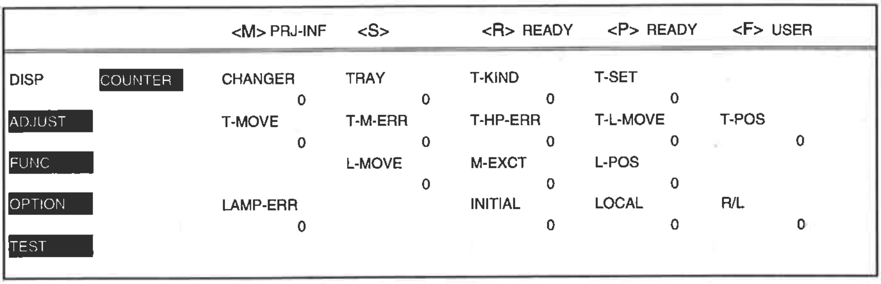
1. High-Order 2 Digits 01, 02, or 03.

last 2 digits: jam Sensor code	Sensor
xx01	Vertical path assembly from cassette 4
xx02	Vertical path assembly from cassette 3
xx03	Vertical path assembly from duplexing unit
xx04	Vertical path assembly from cassette 2
xx05	No. 1 feeding assembly (horizontal path assembly)
xx06	For future use.
xx07	Pre-registration sensor
xx08	Post-transfer sensor
xx09	Pre-transfer sensor
xx0A	Separation sensor
xx0B	Internal delivery assembly
xx0C	External delivery assembly
xx0D	Delivery vertical path assembly 1
xx0E	Delivery vertical path assembly 2
xx0F	Pre-reversal sensor
xx10	Post-reversal sensor
xx11	Reversing assembly outlet sensor
xx12	Duplexing feeding assembly sensor
xx18	Buffer sensor assembly
xx20	Pre-cleaner paper sensor

2. High-Order 2 Digits 05

last 2 digits: jam Sensor code	Sensor
xx03	Feeding delay jam
xx04	Feeding stationary jam
xx06	Staple jam
xx07	Power-on jam
xx08	Door open (feeding)
xx09	Door open (non feeding)
xx0A	Outside bin jam

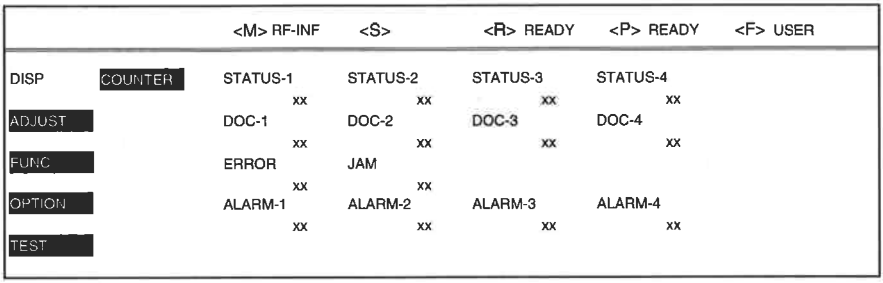
9. Projector State Display



```
                           <M> PRJ-INF   <S>          <R> READY    <P> READY    <F> USER

DISP      COUNTER          CHANGER       TRAY         T-KIND       T-SET
                                 0             0            0            0
ADJUST                     T-MOVE        T-M-ERR      T-HP-ERR     T-L-MOVE     T-POS
                                 0             0            0            0            0
FUNC                                     L-MOVE       M-EXCT       L-POS
                                               0            0            0
OPTION                     LAMP-ERR                   INITIAL      LOCAL        R/L
                                 0                          0            0            0
TEST
```

Item	Description	State
CHANGER	Presence/absence of rotary changer	1: present
TRAY	Presence/absence of slide tray	1: present
T-KIND	Type of tray	1: 140 0: 80
T-SET	Presence of slide	1: present
T-MOVE	Tray movement	1: moving
T-M-ERR	Tray drive mechanical error	1: error
T-HP-ERR	Tray home position error	1: error
T-L-MOVE	Tray local movement	1: moving
T-POS	Tray position	0: home position 1: increasing by 1 for each feeding operation
L-MOVE	Lens movement	1: moving
M-EXCT	Motor excitation	1: excited
L-POS	Lens position	0: home position
LAMP-ERR	Lamp open-circuit detection	1: open circuit
INITIAL	Initialization	1: initializing
LOCAL	Local movement	1: moving
R/L	Remote/local	0: remote 1: local

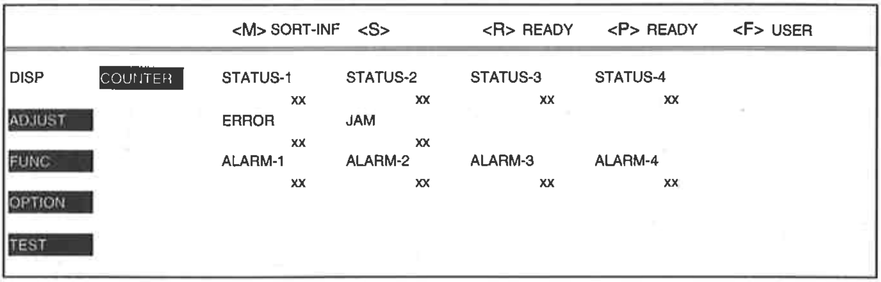
10. RDF State Display



```
                        <M> RF-INF   <S>          <R> READY    <P> READY    <F> USER

DISP      COUNTER       STATUS-1     STATUS-2     STATUS-3     STATUS-4
                              xx           xx           xx           xx
ADJUST                  DOC-1        DOC-2        DOC-3        DOC-4
                              xx           xx           xx           xx
FUNC                    ERROR        JAM
                              xx           xx
OPTION                  ALARM-1      ALARM-2      ALARM-3      ALARM-4
                              xx           xx           xx           xx
TEST
```

Item	Description
STATUS-1/2/3/4	For R&D
DOC-1/2/3/4	For R&D
ERROR	Indicates the error code from the RDF controller PCB. 01H: equivalent of E401 02H: equivalent of E402 03H: equivalent of E403 04H: equivalent of E404 05H: equivalent of E405 06H: no equivalent 07H: equivalent of E407 11H: equivalent of E411 21H: equivalent of E400
JAM	See the RDF-E1 Service Manual.
ALARM-1/2/3/4	Indicates the alarm code from the RDF controller PCB. 01H: re-circulating bar idle swing 02H: no equivalent 03H: separation failed 04H: separation skew 05H: no equivalent

11. Sorter state Display



```
                          <M> SORT-INF  <S>          <R> READY    <P> READY    <F> USER

DISP      COUNTER     STATUS-1       STATUS-2       STATUS-3       STATUS-4
                            xx             xx             xx             xx
ADJUST                ERROR          JAM
                            xx             xx
FUNC                  ALARM-1        ALARM-2        ALARM-3        ALARM-4
                            xx             xx             xx             xx
OPTION

TEST
```

Item	Description
STATUS-1/2/3/4	For R&D
ERROR	See the Stapler Sorter-F1/Sorter-D1 Service Manual.
JAM	Indicates the jam code from the sorter controller PCB. 03H: feeding delay jam 04H: feeding stationary jam 06H: staple jam 07H: power-on jam 08H: door open jam (feeding) 09H: door open jam (non feeding)
ALARM-1/2/3/4	Indicates the alarm code from the sorter controller PCB. ALARM-1 02H: overstacking ALARM-2 02H: staple jam 03H: stapler safery protective mechanism on 05H: stapling overstacking 07H: mixed paper sizes (horizontal) 08H: no stapling unit 0AH: no staple ALARM-3/4 For future

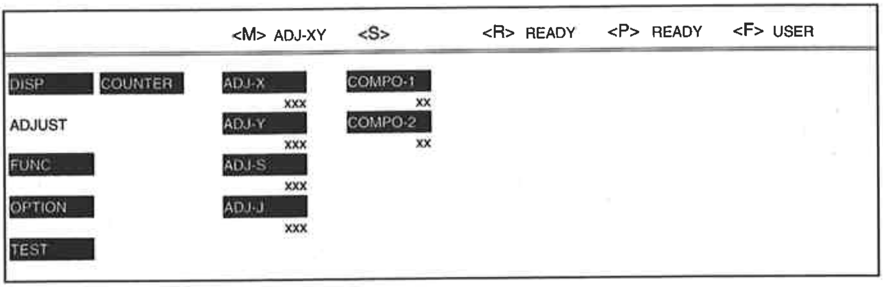
C. Adjustment Mode (ADJUST)

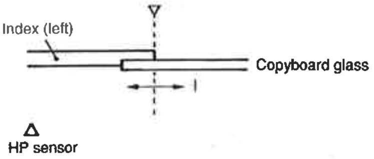
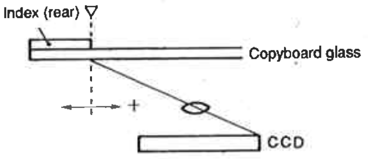
		<M>	<S>	<R> READY	<P> READY	<F> USER
DISP	COUNTER	ADJ-XY	ATT-RTN	DOC-REC	PROJ	ED/RF
ADJUST		V-CONT	HV-OFST	COL-ADJ	PASCAL	ADJ-MISC
FUNC			HV-ATT			
OPTION			HV-TR			
TEST			HV-SP			

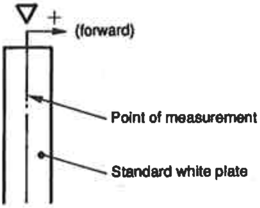
1	ADJ-XY	Adjustment of the image read start position.
2	ATT-RTN	Adjustment of attraction rotation.
3	DOC-REC	Adjustment of the original detection area/slice level.
4	PROJ*	Projector area adjustment.
5	ED/RF	Adjustment of the editor.
6	V-CONT	Adjustment of the original detection area/slice level.
7	HV-OFST	Adjustment of the high-voltage output of attraction/transfer/separation.
8	COL-ADJ	Correction of the color balance adjustment for the user.
9	PASCAL	Decision on use or not use the data obtained by automatic gradation correction control and display of data related to automatic gradation correction control.
10	ADJ-MISC	(Adjustment other than the above.)
11	HV-ATT	Fine-adjustment of the attraction high-voltage output by condition.
12	HV-TR	Fine-adjustment of the transfer high-voltage output by condition.
13	HV-SP	Fine-adjustment of the separation high-voltage output by condition.

*Not indicated if the projector is not installed.

1. Adjusting the Image Read Position Start Position


<M> ADJ-XY
<S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
ADJUST
FUNC
OPTION
TEST
ADJ-X
xxx
ADJ-Y
xxx
ADJ-S
xxx
ADJ-J
xxx
COMPO-1
xx
COMPO-2
xx

Item	Description	Settings
ADJ-X	Make adjustments so that the image read start position matches the reference point on the copyboard glass. Fine-Adjusting the Distance between the Scanner HP Sensor and the Read Start Position • unit: number of steps of the stepping motor. • See next page.  Index (left) Copyboard glass HP sensor	–200 ~ +200 (–3.9 ~ +3.9mm) unit: 0.107 mm (approx.)
ADJ-Y	Fine-Adjusting the CCD Read Start Position • unit: pixels • See next page.  Index (rear) Copyboard glass CCD	–100 ~ +100 (–2.5 ~ +2.5mm) unit: 0.06 mm (approx.)
ADJ-J	Adjusting the Initial Rotation Period of the Scanning Motor	0 ~ +500 unit: 0.1 ms (approx.)

Item	Description	Settings
ADJ-S	Fine-Adjusting the Position of Measuring the Standard White Plate for Shading Correction Data • unit: number of steps of the stepping motor. • Scratches or dirt on the standard white plate vertical white lines on copies conspicuous; this adjustment shifts the point of measurement taken by ADJ-S.  + (forward) Point of measurement Standard white plate	0 ~ 45 (0 ~ 4.8mm) unit: 0.107 mm (approx.)
COMPO-1	For R & D (not used)	
COMPO-2	For R & D (not used)	

Adjusting the Image Read Start Position

You must check the point of attraction before making this adjustment.

1) Before activating service mode, set the original detection to 'OFF'.
2) Bring up the ADJ-XY screen, and press the Copy Start key.
   - the appropriate copy mode is set automatically, and a copy is made with a shift of about 50 mm as shown in Figure 3-1103.
3) If any part of the image is missing, decrease ADJ-X, ADJ-Y.
4) If areas outside the image area is copied, increase ADJ-X, ADJ-Y.

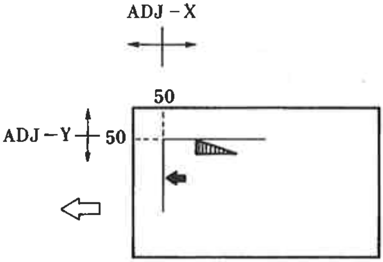
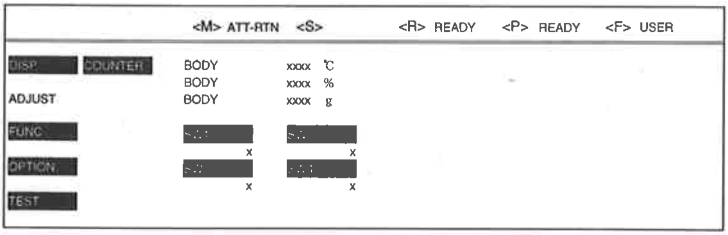


Figure 3-1103

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

2. Attraction Rotation



```
                    <M> ATT-RTN   <S>          <R> READY    <P> READY    <F> USER

DISP   COUNTER      BODY         xxxx  ℃
                    BODY         xxxx  %
ADJUST              BODY         xxxx  g

FUNC
                              x            x
OPTION
                              x            x
TEST
```

Item	Description	Remarks
BODY (°C)	Indicates the machine internal temperature measured by the environment sensor.	Identical to the notation under 'DISPLAY→ANALOG'.
BODY (%)	Indicates the machine internal humidity measured by the environment sensor.	
BODY (g)	Indicates the machine internal absolute humidity (g) measured by the environment sensor.	
SW1 SW2 SW3 SW4 (See note)	A single attraction rotation will be added to the normal sequence according to each switch setting regardless of the type of copy paper (plain or otherwise); see the table below. (The sequence will be identical to the sequence used in thick paper/special paper mode.)	

- Details of SW1 through SW4
  A single attraction rotation will be added when each of the switches in the following table is set to '1' and with the mode selected for the checked (✔) cells.

	Copy mode (one-sided/two-sided)		Copy mode (number of colors)	
	1st side of one-sided/two-sided	2nd side of two-sided	Mono	2 or more
SW1	✔			✔
SW2		✔		✔
SW3	✔		✔	✔
SW4		✔	✔	✔

For example,

- If only SW2 is set to '1', an attraction rotation will be added to copying on the second side of a two-sided copy made in full color.
- If both SW3 and SW4 are set to '1', an attraction rotation will be added to all copying modes.

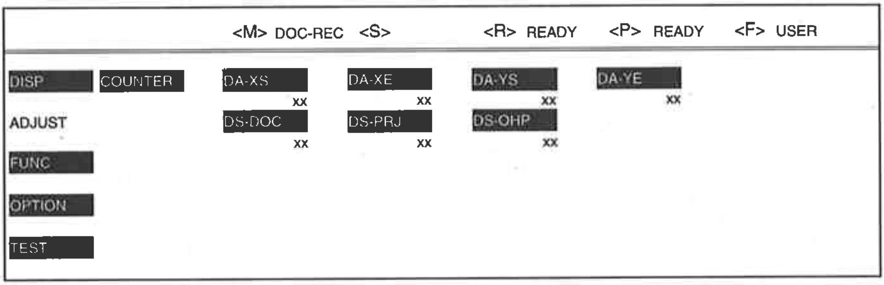
Note:

If you replaced a PCB or cleared a RAM, the values are reset to standard values, necessitating re-input. Make sure you record the items and the values whenever you must change the values on the service label in consideration of this.

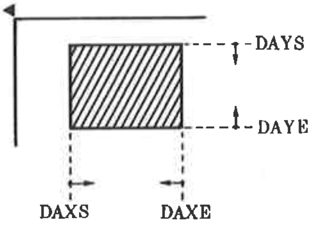
Reference

- This service mode will prove effective when correcting color displacement (magenta displacement/unevenness) caused by faulty attraction.
- Use 'TEST→PG→TYPE=6' (grid) in service mode to check for magenta displacement.
- Use 'TEST→PG→TYPE=5' (halftone), 'DENS-M/C/Y/K=25', or 'TXPH=1' in Service Mode to check for magenta unevenness.

3. Adjusting the Original Detection Area/Slice Level



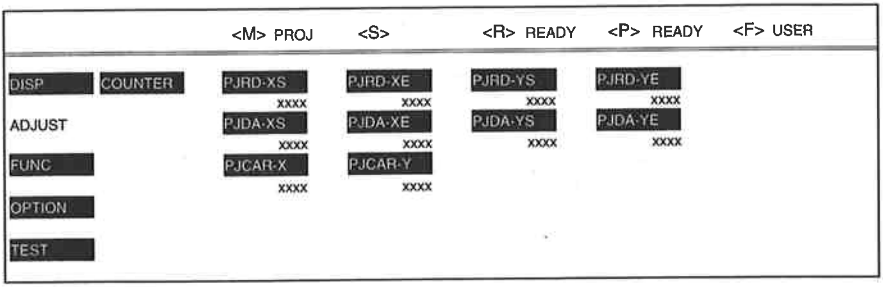
		<M> DOC-REC	<S>	<R> READY	<P> READY <F> USER
DISP	COUNTER	DA-XS xx	DA-XE xx	DA-YS xx	DA-YE xx
ADJUST		DS-DOC xx	DS-PRJ xx	DS-OHP xx	
FUNC					
OPTION					
TEST					

Item	Description	Remarks
DA-XS DA-XE DA-YS DA-YE (See note)	Adjusting the Original Detection Area An original must remain level on copyboard glass in original detection mode; otherwise, the edges of the original turn out black on the copy. Set the amount of frame erasure in this mode.  Any changes made in this mode affects the amount of frame erasure in original detection mode when the projector is used.	-99 ~ 99 (0 ~ 6.3mm) reference XS=24 XE=8 YS=32 YE=24 unit: 0.06 mm (approx.)
DS-DOC DS-PRJ DS-OHP (See note)	Adjusting the Slice Level in Original Detection You can set any slice level for original detection. A higher slice level will increase the original detection ability but can lead to wrong detection. Use it to detect the projection area when the projector is used. Use it to detect 6×6 ot 8×10 film placed on the copyboard glass when the projector is used.	0 ~ 31 (density level 0 ~ 248) reference value: DS-DOC=21 PRJ=28 OHP=22

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

4. Adjusting the Projector Area



<M> PROJ <S> <R> READY <P> READY <F> USER

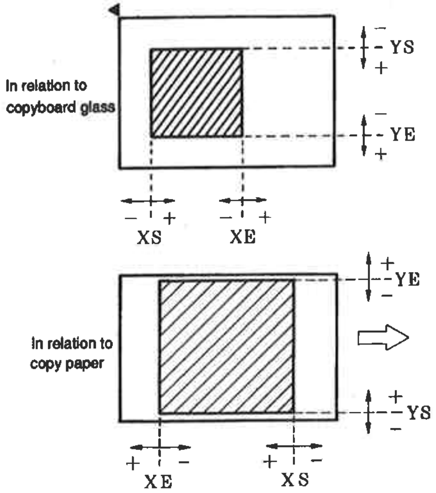
DISP COUNTER PJRD-XS xxxx PJRD-XE xxxx PJRD-YS xxxx PJRD-YE xxxx

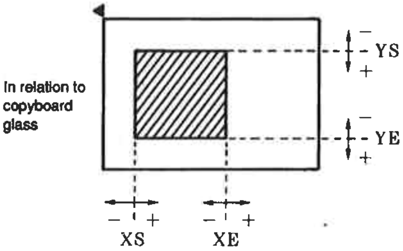
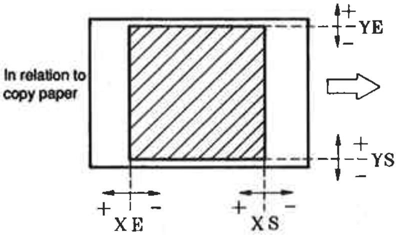
ADJUST PJDA-XS xxxx PJDA-XE xxxx PJDA-YS xxxx PJDA-YE xxxx

FUNC PJCAR-X xxxx PJCAR-Y xxxx

OPTION

TEST

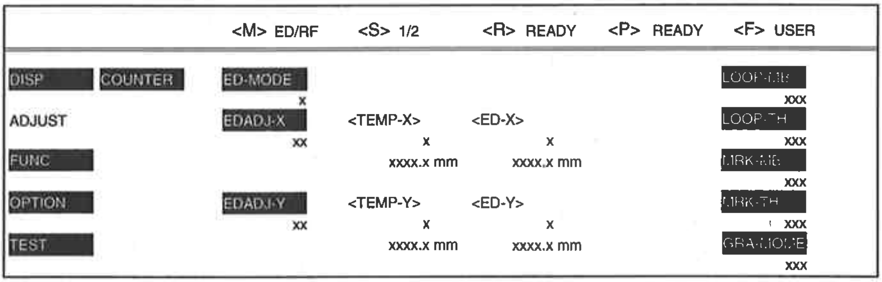
Item	Description	Settings
PJRD-XS PJRD-XE PJRD-YS PJRD-YE	Use it to fine adjust the read area when the original detection mechanism is off while the projector is in use or if original detection fails when the original detection mechanism is on.  In relation to copyboard glass YS YE XS XE In relation to copy paper YE YS XE XS	–300 ~ +300 (–19.0 ~ +19.0mm) unit: 0.06 mm (approx.; in reference to copyboard glass) reference value: 0

Item	Description	Settings
PJDA-XS PJDA-XE PJDA-YS PJDA-YE	Use it to fine-adjust the area measured for original detection when the original detection is on with the projector in use. • Use it also on the read area with the original detection mechanism off in copyboard mode. • The area at the time when the reference value (0) is used is 5 mm within the Fresnel lens.  	–99 ~ +99 XS, YE (6.3 ~ +6.3mm) unit: 0.11 mm (approx.) YS, XE (–10.9 ~ +10.9mm) unit: 0.11 mm (approx.)
PJCAR-X PJCAR-Y	Use it to correct the position of projection when original detection is off while the auto changer is in use.	–100 ~ +100 reference: 0

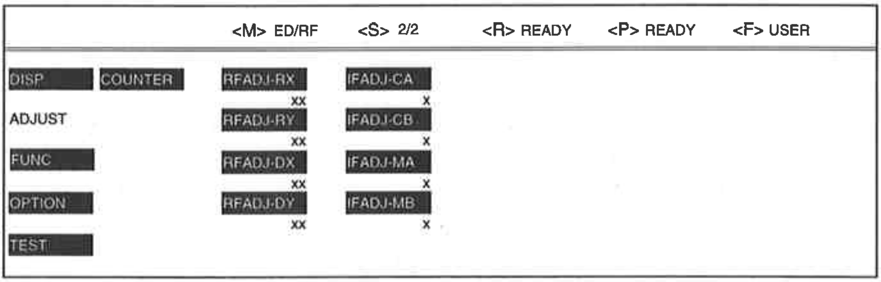
Reference:

PJDA is adjustment of the area to be measured, but NOT adjustment to the area measured. To erase the black frame on copies or to decrease it, adjust 'YE' under 'DA-XS' of 'DOC-REC'.

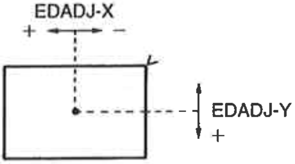
5. Adjusting the Editor



```
                        <M> ED/RF    <S> 1/2      <R> READY    <P> READY    <F> USER

DISP      COUNTER       ED-MODE                                                LOOP-MB
                              x                                                    xxx
ADJUST                  EDADJ-X      <TEMP-X>        <ED-X>                    LOOP-TH
                             xx             x             x                        xxx
FUNC                                     xxxx.x mm     xxxx.x mm               MRK-MB
                                                                                   xxx
OPTION                  EDADJ-Y      <TEMP-Y>        <ED-Y>                    MRK-TH
                             xx             x             x                        xxx
TEST                                     xxxx.x mm     xxxx.x mm               GRA-MODE
                                                                                   xxx
```



```
                        <M> ED/RF    <S> 2/2      <R> READY    <P> READY    <F> USER

DISP      COUNTER       RFADJ-RX     IFADJ-CA
                             xx             x
ADJUST                  RFADJ-RY     IFADJ-CB
                             xx             x
FUNC                    RFADJ-DX     IFADJ-MA
                             xx             x
OPTION                  RFADJ-DY     IFADJ-MB
                             xx             x
TEST
```

Item	Description	Settings
ED-MODE	Switching Editor Operation Mode 0: input prohibit 1: 1-point input 2: continuous input (Use to make checks during adjustment.)	
EDADJ-X	Editor input coordinates in the sub scanning direction (X direction)	-99 ~ +99 -12.6 ~ +12.6 mm unit: 0.13 mm (approx.) standard: 0
<TEMP-X>	Editor sub scanning direction coordinate input value and mm conversion value	
<ED-X>	Editor sub scanning direction adjusted value and mm conversion value	
EDADJ-Y	Editor input coordinates in the main scanning direction (Y direction)	
<TEMP-Y>	Editor main scanning direction coordinate input value and mm conversion value	
<ED-Y>	Editor main scanning direction adjusted value and mm conversion value 	

Item	Description	Settings
LOOP-MB (See note)	Use it to change the processing method used to read images into memory for coloring in area specification/color create Mode. A higher setting lets you fill gaps easily; if the setting is too high, however, the color may spread over the gap.	0 ~ 3 standard: 0
LOOP-TH (See note)	Use it to adjust the slice level adjustment value for binarization used when reading images into memory for coloring in area specification/color create mode. A higher setting lets you read thinner lines.	0 ~ 225 standard: 192
MRK-MB	Use it to change the image data processing method used when reading images into memory for high-light/point specification mode. A higher setting lets you fill gaps easily.	0 ~ 3 standard: 0
MRK-TH	Use it to adjust the slice level for binarization used for reading images into memory in high-light/point specification mode.	0 ~ 225 standard: 128
GRA-MODE	When gradation processing is executed in a copier equipped with an IP-ED PCB, a graduated color is deposited in non-text areas so as to avoid changing the hue of the text. 0: conventional 1: deposit graduated color in entire area (of original; as if in the absence of IP-ED PCB)	0 ~ 1 standard: 0
RFADJ-RX (Notes 1/2)	Use it to adjust the original read start position (X direction) for pick-up from the RDF tray.	0 ~ 99 unit: 0.1 mm standard: 0
RFADJ-RY (Notes 1/2)	Use it to adjust the original read start position (Y direction) for pick-up from the RDF tray.	0 ~ 99 unit: 0.1 mm standard: 23
RFADJ-DX (Notes 1/2)	Use it to adjust the original read start position (X direction) for pick-up from RDF manual feeding.	0 ~ 99 unit: 0.1 mm standard: 0
RFADJ-DY (Notes 1/2)	Use it to adjust the original read start position (Y direction) for pick-up ROM RDF manual feeding	0 ~ 99 unit: 0.1 mm standard: 23
IFADJ-CA/CB/ MA/MB	For R&D (not used)	

Note 1:

The value of the item returns to its standard value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

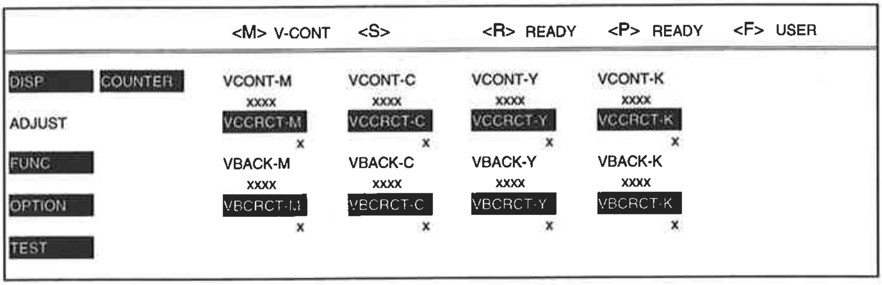
Note 2:

Execute the item when installing an RDF or when adjusting the original stop position or horizontal registration. Further, you must perform the following if the ROM of the reader controller is version 13.04 or earlier:

a. Set '23' (initial value) to '-DY' under 'RFADJ-RY' before starting installation.

b. Set 'center shift' to 'ON' when adjusting the horizontal registration.

6. Adjusting the Photosensitive Drum Surface Potential Contrast



```
                     <M> V-CONT   <S>          <R> READY    <P> READY    <F> USER

DISP      COUNTER    VCONT-M      VCONT-C      VCONT-Y      VCONT-K
                       xxxx         xxxx         xxxx         xxxx
ADJUST               VCCRCT-M     VCCRCT-C     VCCRCT-Y     VCCRCT-K
                            x            x            x            x
FUNC                 VBACK-M      VBACK-C      VBACK-Y      VBACK-K
                       xxxx         xxxx         xxxx         xxxx
OPTION               VBCRCT-M     VBCRCT-C     VBCRCT-Y     VBCRCT-K
                            x            x            x            x
TEST
```

Item	Description	Remarks
VCONT-M VCONT-C VCONT-Y VCONT-K	Indicates the current value of the target potential contrast	
VCCRCT-M VCCRCT-C VCCRCT-Y VCCRCT-K (See note)	Fine-Adjusting the Contrast Potential Target Value • Effective only in auto contrast mode (VCONT=0 under ADJ-MISC).	–8 ~ +8 reference: 0 +: darker –: lighter
VBACK-M VBACK-C VBACK-Y VBACK-K	Indicates current value of de-fogging potential	
VBCRCT-M VBCRCT-C VBCRCT-Y VBCRCT-K (See note)	Adjusting the defogging potential (Vback)	–8 ~ +8 reference: 0 +: darker –: lighter

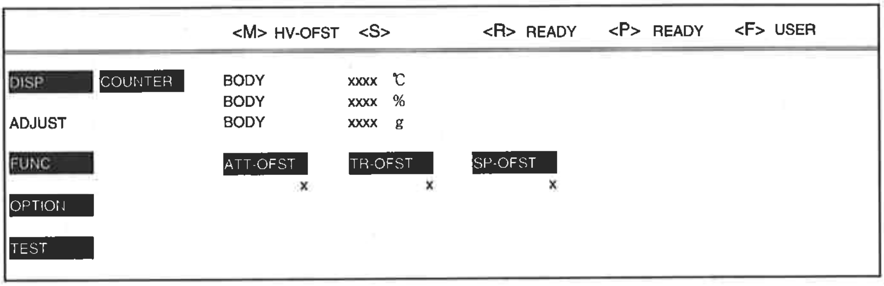
Reference

Vcont + Vcrct + Vtmpr = (VD – VL) – Vback

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

7. Adjusting the High-Voltage Output of Attraction/Transfer/Separation



```
                         <M> HV-OFST   <S>          <R> READY    <P> READY    <F> USER

DISP        COUNTER      BODY          xxxx  ℃
                         BODY          xxxx  %
ADJUST                   BODY          xxxx  g

FUNC                     ATT-OFST      TR-OFST      SP-OFST
                                x             x             x
OPTION

TEST
```

Item	Description	Remarks
BODY (°C)	Indicates the machine internal temperature measured by the environment sensor.	Identical to the notation under 'DISPLAY→ANALOG'.
BODY (%)	Indicates the machine internal humidity measured by the environment sensor.	
BODY (g)	Indicates the machine internal absolute humidity (g) measured by the environment sensor.	
ATT-OFST (See note)	Adjusting the high-voltage output for attraction.	Setting :–2 to +2 Unit :2.5 µA Standard: 0
TR-OFST (See note)	Adjusting the high-voltage output for transfer.	Setting :–5 to +5 Unit :0.5 µA Standard: 0
SP-OFST (See note)	Adjusting the high-voltage output for separation (DC component).	Setting :–4 to +2 Unit :60 µA Standard: 0

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

Reference

- 'ATT-OFST' corresponds to 'HV-ATT' of ROM version 2 or earlier.
- 'TR-OFST' corresponds to 'HV-TR' of ROM version 2 or earlier.

8. Correcting the Color Balance Adjustment for the User

		<M> COL-ADJ	<S>	<R> READY	<P> READY	<F> USER
DISP	COUNTER	ADJ-M x	ADJ-C x	ADJ-Y x	ADJ-K x	
ADJUST		OFST-M xx	OFST-C xx	OFST-Y xx	OFST-K xx	
FUNC		P-ADJ-M x	P-ADJ-C x	P-ADJ-Y x	P-ADJ-K x	
OPTION		P-OFST-M xx	P-OFST-C xx	P-OFST-Y xx	P-OFST-K xx	
TEST		P-TBL-M xx	P-TBL-C xx	P-TBL-Y xx	P-TBL-K xx	

Item	Description	Settings
ADJ-M C Y K (See note)	Correcting the Color Balance Adjustment for the User • You must return the color balance for the user to '0' before making adjustments in this mode. • Make adjustments as indicated in the Image Adjustment Basic Procedure. Note: The reference value is automatically set in relation to 'OPTION' -> 'R-OPT' -> 'NEW-COL'.	–8 ~ +8 reference: if NEW-COL=1, M=0, C=0, Y=0, K=0 if NEW-COL=0, M=–1, C=0, Y=–3, K=0 +: darker –: lighter
OFST-M C Y K (See note)	Adjusting the Density of the Light Area and Color Balance • If fogging is noted, decrease the setting. • To enhance reproduction of images of extremely low density, increase the setting. • To increase the reproducibility of areas where the	–16 ~ +16 reference: M=2 C=0 Y=0 K=0
P-ADJ-M C Y K (Notes 1/2)	Correcting the color Balance Adjustment for Output from the Controller • Be sure to return color balance adjustment for the user to '0' before using this mode. • Make adjustments according to the Image Adjustment Basic Procedure.	–8 ~ +8 reference: if NEW-COL=1, M=1, C=0, Y=–3, K=0 if NEW-COL=0, M=0, C=0, Y=0, K=0 +: darker –: lighter
P-OFST-M Y K (Notes 1/2)	Adjusting Color Balance and Light Areas for Output from C the Controller • Make adjustments according to the Image Adjustment Basic Procedure. • If fogging is noted, increase the value. • To increase the density (if appreciably light), decrease the value.	–16 ~ +16 Standard: 0 reference: M=2 C=0 Y=0 K=0
P-TBL-M C Y K	Fine-Adjusting the Hue to simulate Offset Printing Compare the M, C, Y, and K each against printed material; If the print-out is lighter, increase 'P-TBL-M/C/Y/K' If the print-out is darker, decrease 'P-TBL-M/C/Y/K'.	–3 ~ +3 Standard: 0 See the descriptions for 'OPTION' -> 'R-OPT' -> 'MANAGE'.

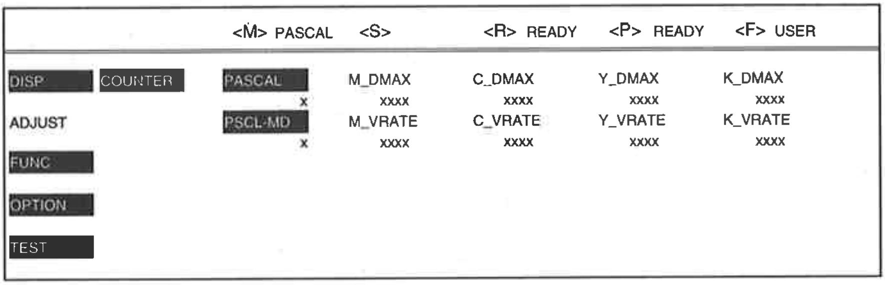
Note 1:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

Note 2:

Here, the conditions of use vary according to the setting of 'EM-TYPE' of 'REMOTE' under 'OPTION'.

9. PASCAL (auto gradation correction control)



<M> PASCAL <S> <R> READY <P> READY <F> USER

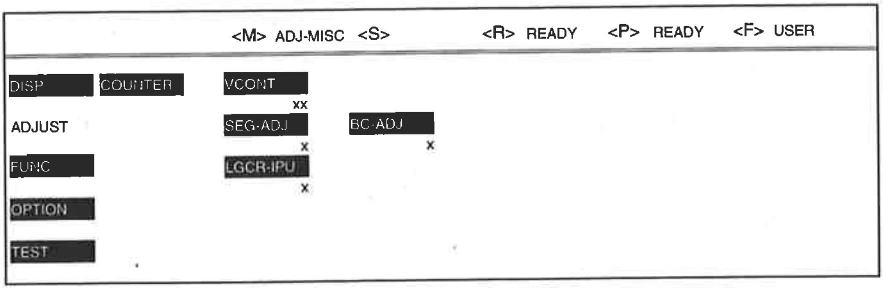
DISP	COUNTER	PASCAL	M_DMAX	C_DMAX	Y_DMAX	K_DMAX
		x	xxxx	xxxx	xxxx	xxxx
ADJUST		PSCL-MD	M_VRATE	C_VRATE	Y_VRATE	K_VRATE
		x	xxxx	xxxx	xxxx	xxxx
FUNC						
OPTION						
TEST						

Item	Description	Remarks
PASCAL	Specifies whether to use the data for the contrast potential and gradation correction obtained by automatic gradation correction control. 0 : Use. 1 : Do not use.	Normally, '1'; but '0' only when adjusting the image.
M-DMAX C-DMAX Y-DMAX K-DMAX	Indicates the result of comparing the solid density measured when automatic gradation correction control is executed against the design value in terms of %.	Optimum: 75 or higher.
RSCL-MD	Use it to smooth out the gradation area when the output is from the controller. 0 : Conventional 1 : Do not use 2 : Smoothes out gradation areas (however, copying will slow down by about 0.5 sec) Note: If '2' is set, you need to execute auto gradation correction in user mode.	Standard: 0
M-VRATE C-VRATE Y-VRATE K-VRATE	Indicates the control value used to determine the contrast potential (based on M/C/Y/K-DMAX).	0 ~ +2 Reference: 2

Reference

- If the value of 'M/C/Y/K-DMAX' is lower than 75, development with a value lower than 75 may be assumed to have a fault.
- If all value of 'M/C/Y/K-DMAX' are lower than 75, transfer/fixing may be assumed to have a fault.
- If the value of 'M/C/Y/K-DMAX' is 120 or higher and the copy has fogging, 'ATR' for the corresponding color may be suspected to have an error.

10. ADJ-MISC

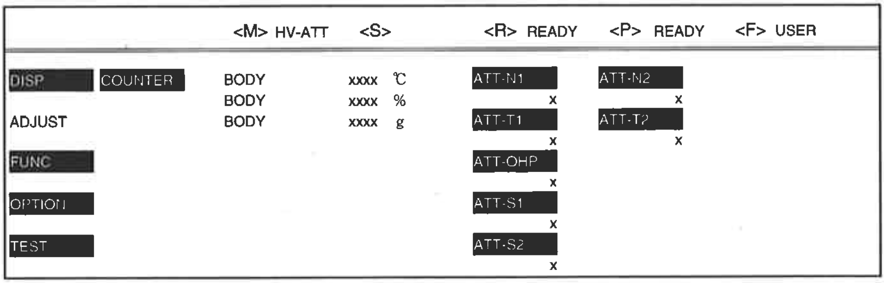


<table>
<tr><th>Item</th><th>Description</th><th>Remarks</th></tr>
<tr><td>VCONT</td><td>Switching between Auto and Manual for the Target Contrast Potential (VG, VDC)
0: auto (set by auto gradation correction control)
1–8: manual
<table>
<tr><th></th><th>M</th><th>C</th><th>Y</th><th>K</th></tr>
<tr><td>1</td><td>320V</td><td>315V</td><td>315V</td><td>330V</td></tr>
<tr><td>2</td><td>317V</td><td>312V</td><td>312V</td><td>328V</td></tr>
<tr><td>3</td><td>310V</td><td>305V</td><td>305V</td><td>321V</td></tr>
<tr><td>4</td><td>295V</td><td>290V</td><td>290V</td><td>308V</td></tr>
<tr><td>5</td><td>275V</td><td>270V</td><td>270V</td><td>290V</td></tr>
<tr><td>6</td><td>270V</td><td>270V</td><td>270V</td><td>270V</td></tr>
<tr><td>7</td><td>270V</td><td>270V</td><td>270V</td><td>270V</td></tr>
<tr><td>8</td><td>270V</td><td>270V</td><td>270V</td><td>270V</td></tr>
<tr><td>9</td><td>reserved</td><td>reserved</td><td>reserved</td><td>reserved</td></tr>
<tr><td>10</td><td>reserved</td><td>reserved</td><td>reserved</td><td>reserved</td></tr>
<tr><td>11</td><td>reserved</td><td>reserved</td><td>reserved</td><td>reserved</td></tr>
<tr><td>12</td><td>reserved</td><td>reserved</td><td>reserved</td><td>reserved</td></tr>
</table></td><td>0 ~ 12
Use 1 through 8 for checks only; return it to '0' after each check.
'9' through '12' are for factory only.</td></tr>
<tr><td>SEG-ADJ
(See note)</td><td>Fine-Adjusting the Text/Photo Separation Level in Text/Photo Mode or Text/Print Paper Mode
+: tends to identify as photo
–: tends to identify as text
This mode is used to correct 'Text/Photo Adjustment' of user mode.</td><td>–3 ~ +3
reference: 0</td></tr>
<tr><td>BC-ADJ
(See note)</td><td>Black Text Correction
A higher setting causes black text to be darker in 4-color text/photo mode.</td><td>–3 ~ +3
reference: 0</td></tr>
<tr><td>LGCR-IPU</td><td>Set it to '1' if you want the gray balance of images from an external controller to be given priority.</td><td>reference: 0</td></tr>
</table>

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

11. Fine-Adjusting the High-Voltage Output of Attraction by Condition



```
                     <M> HV-ATT   <S>           <R> READY    <P> READY    <F> USER

DISP      COUNTER    BODY         xxxx  ℃       ATT-N1       ATT-N2
                     BODY         xxxx  %            x            x
ADJUST               BODY         xxxx  g       ATT-T1       ATT-T2
                                                     x            x
FUNC                                            ATT-OHP
                                                     x
OPTION                                          ATT-S1
                                                     x
TEST                                            ATT-S2
                                                     x
```

Item	Description	Remarks
BODY (°C)	Indicates the machine internal temperature measured by the environment sensor.	Identical to the notation under 'DISPLAY→ANALOG'.
BODY (%)	Indicates the machine internal humidity measured by the environment sensor.	
BODY (g)	Indicates the machine internal absolute humidity (g) measured by the environment sensor.	
ATT-N1 (See note)	Effective only when all the following conditions are true: Plain paper mode, one-sided copying or 1st side of two-sided copying, 'ATT-RTN' and SW1 or SW3 set to '1'.	Setting : –2 to +2 Unit : 7.5 µA Standard: 0
ATT-N2 (See note)	Effective only when all the following conditions are true: 2nd side of two-sided copying, 'ATT-RTN' and SW2 or SW4 set to '1'.	
ATT-T1 (See note)	Effective only when all the following conditions are true: Thick paper mode, one-sided copying or 1st side of two-sided copying.	
ATT-T2 (See note)	Effective only when all the following conditions are true: Thick paper mode, 2nd side of two-sided copying.	
ATT-OHP (See note)	Effective in OHP mode.	
ATT-S1 (See note)	Effective in special paper 1 mode.	
ATT-S2 (See note)	Effective in special paper 2 mode.	

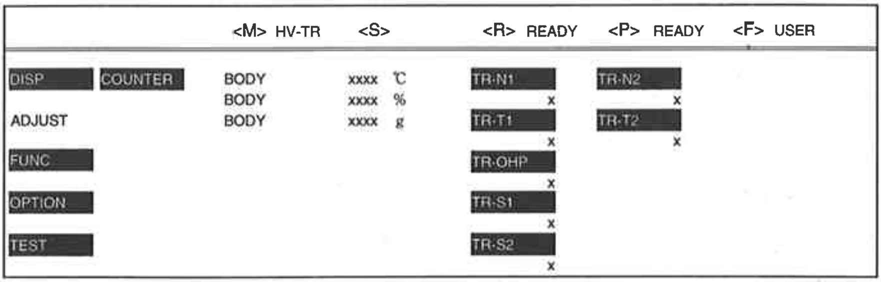
Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

Reference

- This service mode is effective when attraction failure occurs or a transfer fault occurs in each mode.

12. Fine-Adjusting the High-Voltage Output of Transfer by Condition



```
                    <M> HV-TR   <S>          <R> READY   <P> READY   <F> USER

DISP      COUNTER   BODY        xxxx ℃       TR-N1       TR-N2
                    BODY        xxxx %           x           x
ADJUST              BODY        xxxx g       TR-T1       TR-T2
                                                 x           x
FUNC                                         TR-OHP
                                                 x
OPTION                                       TR-S1
                                                 x
TEST                                         TR-S2
                                                 x
```

Item	Description	Remarks
BODY (°C)	Indicates the machine internal temperature measured by the environment sensor.	Identical to the notation under 'DISPLAY→ANALOG'.
BODY (%)	Indicates the machine internal humidity measured by the environment sensor.	
BODY (g)	Indicates the machine internal absolute humidity (g) measured by the environment sensor.	
TR-N1 (See note)	Effective only when all the following conditions are true: Plain paper mode, one-sided copying or 1st side of two-sided copying, 'ATT-RTN' and SW1 or SW3 set to '1'.	Setting : –4 to +4 Unit : 1.0 µA Standard: 0
TR-N2 (See note)	Effective for the 2nd side of two-sided copying.	
TR-T1 (See note)	Effective only when all the following conditions are true: Thick paper mode, one-sided copying or 1st side of two-sided copying.	
TR-T2 (See note)	Effective only when all the following conditions are true: Thick paper mode, 2nd side of two-sided copying.	
TR-OHP (See note)	Effective in OHP mode.	
TR-S1 (See note)	Effective in special paper 1 mode.	
TR-S2 (See note)	Effective in special paper 2 mode.	

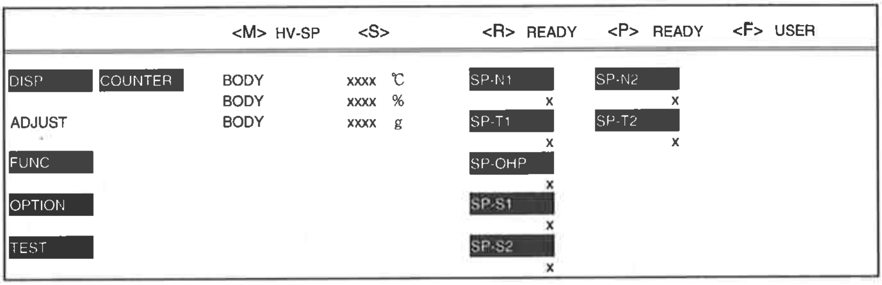
Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

Reference

- This service mode is effective when transfer failure occurs or a transfer fault occurs in each mode.

13. Fine-Adjusting the High-Voltage Output of Separation by Condition



```
                    <M> HV-SP    <S>          <R> READY     <P> READY     <F> USER

DISP      COUNTER   BODY        xxxx  ℃       SP-N1         SP-N2
                    BODY        xxxx  %             x             x
ADJUST              BODY        xxxx  g       SP-T1         SP-T2
                                                    x             x
FUNC                                          SP-OHP
                                                    x
OPTION                                        SP-S1
                                                    x
TEST                                          SP-S2
                                                    x
```

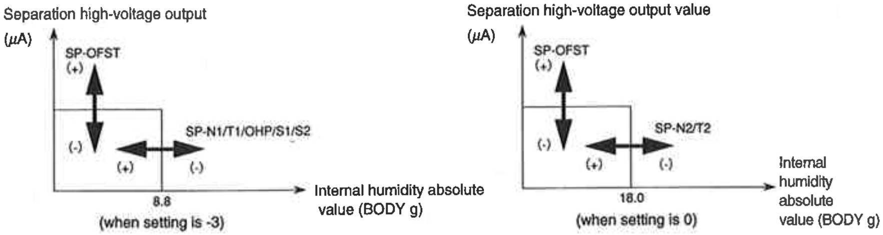
Item	Description	Remarks
BODY (°C)	Indicates the machine internal temperature measured by the environment sensor.	Identical to the notation under 'DISPLAY→ANALOG'.
BODY (%)	Indicates the machine internal humidity measured by the environment sensor.	
BODY (g)	Indicates the machine internal absolute humidity (g) measured by the environment sensor.	
SP-N1 (See note)	Effective only when all the following conditions are true: Plain paper mode, one-sided copying or 1st side of two-sided copying.	Setting: –5 to +5 Unit: 1.0 g/m³ Standard: –3 (0: SP-N2 only) Changes the timing at which the separation high-voltage output turns off; see Reference b.
SP-N2 (See note)	Effective for the 2nd side of two-sided copying.	
SP-T1 (See note)	Effective only when all the following conditions are true: Thick paper mode, one-sided copying or 1st side of two-sided copying.	
SP-T2 (See note)	Effective only when all the following conditions are true: Thick paper mode, 2nd side of two-sided copying.	
SP-OHP (See note)	Effective in OHP mode.	
SP-S1 (See note)	Effective in special paper 1 mode.	
SP-S2 (See note)	Effective in special paper 2 mode.	

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

Reference

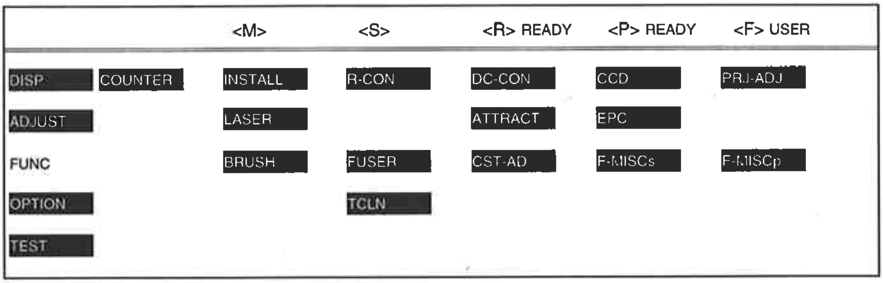
- This service mode is effective when transfer failure occurs or a transfer fault occurs in each mode. For details on how to use the mode, see the descriptions on troubleshooting image faults.
- The machine's high voltage for separation remains off in a high-humidity environment; the standard setting is the machine internal absolute humidity, i.e., 'BODY g=8.8g'.
  The output of the separation high voltage is turned on or off with reference to the data read by the environment sensor, i.e., machine internal absolute humidity, i.e., 'BODYg'. 'HV-SP' is used to change the slice level for turning the output on or off; further, the output may be adjusted by 'ADJUST→HV-OFST→SP-OFST'.


Separation high-voltage output
(μA)
SP-OFST
(+)
(-)
(+)
(-)
SP-N1/T1/OHP/S1/S2
8.8
Internal humidity absolute value (BODY g)
Separation high-voltage output value
(μA)
SP-OFST
(+)
(-)
(+)
(-)
SP-N2/T2
18.0
Internal humidity absolute value (BODY g)

(when setting is -3)

(when setting is 0)

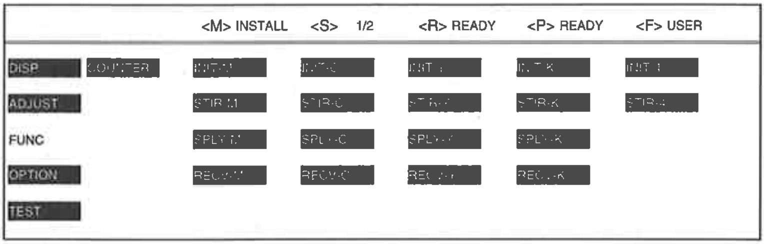
D. Function Mode (FUNCTION)



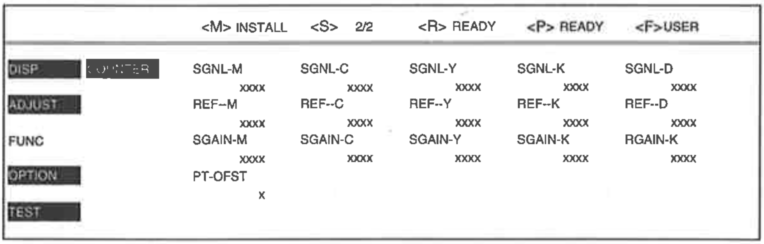
		<M>	<S>	<R> READY	<P> READY	<F> USER
DISP	COUNTER	INSTALL	R-CON	DC-CON	CCD	PRJ-ADJ
ADJUST		LASER		ATTRACT	EPC	
FUNC		BRUSH	FUSER	CST-AD	F-MISCs	F-MISCp
OPTION			TCLN			
TEST						

1	INSTALL	Use it at time of installation.
2	R-CON	Use it for functions related to the reader controller PCB.
3	DC-CON	Use it for functions related to the DC controller PCB.
4	CCD	Use it for functions related to the CCD.
5	PRJ-ADJ	Use it for functions related to the projector.
6	LASER	Use it to functions related to the laser.
7	ATTRACT	Use it for functions related to the point of retention.
8	EPC	Use it for functions related to the measurement of the photosensitive drum potential.
9	BRUSH	Use it for functions related to the transfer/retention brush.
10	FUSER	Use it for functions related to the fixing assembly.
11	CST-AD	Use it for functions related to the cassette paper width.
12	F-MISCs	Use it for functions/inspections related to the reader unit.
13	F-MISCp	Use it for functions/inspections related to the printer unit.
14	TCLN	Use it to operate the polishing roller/oil removing roller.

1. Installation



```
                     <M> INSTALL   <S>   1/2     <R> READY     <P> READY     <F> USER

DISP      COUNTER    INIT-M        INIT-C        INIT-Y        INIT-K        INIT-4

ADJUST               STIR-M        STIR-C        STIR-Y        STIR-K        STIR-4

FUNC                 SPLY-M        SPLY-C        SPLY-Y        SPLY-K

OPTION               RECV-M        RECV-C        RECV-Y        RECV-K

TEST
```



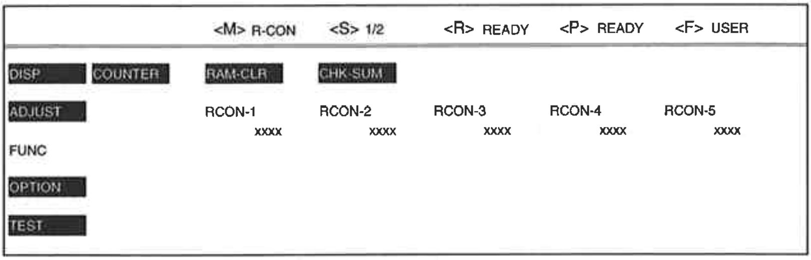
```
                     <M> INSTALL   <S>   2/2     <R> READY     <P> READY     <F>USER

DISP      COUNTER    SGNL-M        SGNL-C        SGNL-Y        SGNL-K        SGNL-D
                           xxxx          xxxx          xxxx          xxxx          xxxx
ADJUST               REF--M        REF--C        REF--Y        REF--K        REF--D
                           xxxx          xxxx          xxxx          xxxx          xxxx
FUNC                 SGAIN-M       SGAIN-C       SGAIN-Y       SGAIN-K       RGAIN-K
                           xxxx          xxxx          xxxx          xxxx          xxxx
OPTION               PT-OFST
                           x
TEST
```

Item	Description	Remarks
INIT-M INIT-C INIT-Y INIT-K	Use it to specify the color for which the initial setting of the toner density signal (SGNL, REF) should be read. • The setting will be indicated on the next screen; be sure to record it on the service label.	
INIT-4	Use it to read the initial settings of the toner density signal (SGNL, REF) of the four colors in sequence. • The setting will be indicated on the next screen; be sure to record it on the service label.	Make sure that the copier is in wait state (<P> in service mode is 'READY') before executing 'INIT-4'
STIR-M STIR-C STIR-Y STIR-K	Use it to specify which developer (color) to be stirred.	
STIR-4	Use it to stir the developers (4 colors) in sequence.	
SPLY-M SPLY-C SPLY-Y SPLY-K	Use it to rotate the cylinder of the developer so that the developing assembly will be supplied with the developer of the color.	
PT-OFST	Indicates the correction value of the laser output for BK ATR control. Is set automatically when 'INIT-K' or 'INIT-4' is executed.	Recorded the value on the Service Label after executing 'INIT-K' or 'INIT-4'.

Item	Description	Remarks
RECV-M RECV-C RECV-Y RECV-K	Use it to rotate the cylinder of the developing assembly so that the developer of the specified color will be drawn out of the developing assembly. • Place a plastic bag or the like under the developer before removing the cap from the developer supply mouth found at the bottom of the developing assembly. **Caution:** This is NOT a mode to be executed at the time of installation.	
SGNL-M SGNL-C SGNL-Y SGNL-K	Indicates the value of the toner density signal effective when 'INIT' has been executed as ATR control. Be sure to record in the label on the DC controller PCB; see Figure 3-1102.	SGNL-M/SGNL-C/ SGNL-Y: normally, 818 ±41.
SGNL-D	Indicates the signal value of the black toner density sensor in relation to the reflected light of the photosensitive drum. Be sure to record in the label on the DC controller PCB; see Figure 3-1102.	Normally, 614 ±21.
REF-M REF-C REF-Y REF-K	Indicates the value of the toner density reference signal when 'INIT' has been executed as ATR control. Be sure to record in the label on the DC controller PCB; see Figure 3-1102.	REF-K: Normally, 818 ±41.
REF-D	Indicates the reference signal value of the black toner density sensor in relation to the reflected light of the photosensitive drum.	
SGAIN-M SGAIN-C SGAIN-Y SGAIN-K	Indicates the value of the gain for the toner density signal at time of ATR control (gain used for setting SGNL-M/SGNL-C/SGNL-Y to '818' and SGNL-D to '614'). Be sure to record in the label on the DC controller PCB; see Figure 3-1102.	
RGAIN-K	Indicates the value of the gain for toner density reference signal at time of ATR control (gain used for setting REF-K to '818'). Be sure to record in the label on the DC controller PCB; see Figure 3-1102.	

Caution:
You must make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing any mode.

2. Functions Related to the Reader Controller PCB



<M> R-CON <S> 1/2 <R> READY <P> READY <F> USER

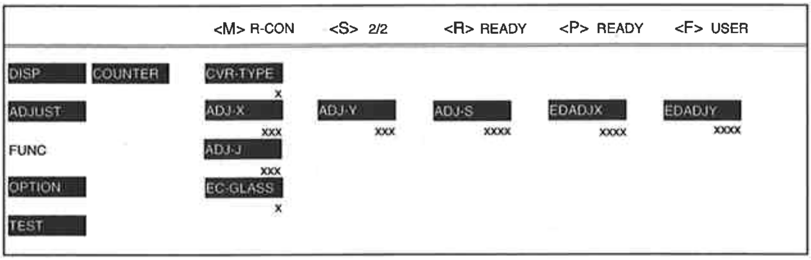
DISP COUNTER RAM-CLR CHK-SUM

ADJUST RCON-1 xxxx RCON-2 xxxx RCON-3 xxxx RCON-4 xxxx RCON-5 xxxx

FUNC

OPTION

TEST



<M> R-CON <S> 2/2 <R> READY <P> READY <F> USER

DISP COUNTER CVR-TYPE x

ADJUST ADJ-X xxx ADJ-Y xxx ADJ-S xxxx EDADJX xxxx EDADJY xxxx

FUNC ADJ-J xxx

OPTION EC-GLASS x

TEST

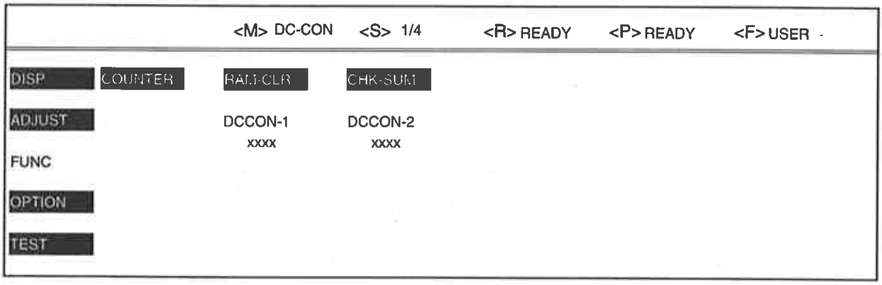
Entering Back up Data

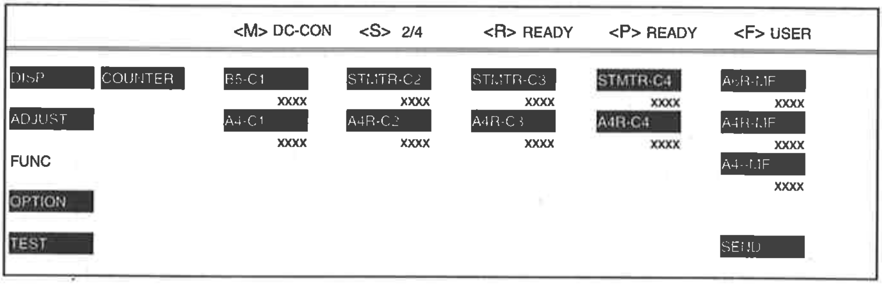
You must enter the data recorded on the label (Figure 3-1102) using the screen whenever you have replaced the reader controller PCB.

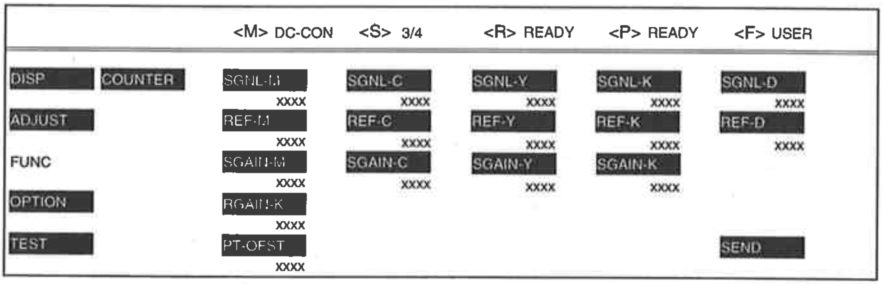
Item	Description	Remarks
RAM-CLR	Use it to clear the RAM on the reader controller PCB and to set the standard settings.	
CHK-SUM	Use it to start checking the ROM on the reader controller PCB. (by totaling the RAM data).	
RCON-1	Indicates the check sum value of Q605 on the reader controller PCB.	
RCON-2	Indicates the check sum value of Q616 on the reader controller PCB.	
RCON-3	Indicates the check sum value of Q617 on the reader controller PCB.	
RCON-4	Indicates the check sum value of Q901 on the reader controller PCB.	
RCON-5	Not used.	
CVR-TYPE	Use it to enter the version of CVR. 0: old type 1: new type	
ADJ-X	Use it to enter the adjustment value of the image read start position in the sub scanning direction.	
ADJ-Y	Use it to enter the adjustment value of the image read start position in the main scanning direction.	

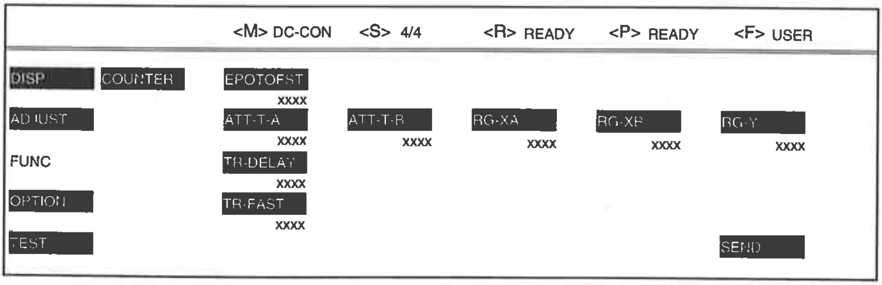
Item	Description	Remarks
ADJ-S	Use it to enter the adjustment value of the point of shading.	
EDADJX	Use it to enter the adjustment value of the specified position in the sub scanning direction of the editor.	
EDADJY	Use it to enter the adjustment value of the specified position in the main scanning direction of the editor.	
ADJ-J	Enter the auxiliary rotation time for the scanner motor.	
EC-GLASS	Set it to '1' if EC-coated glass is used.	The initial setting at time of executing 'RAM-CLR' is '1' for the 115/230V model.

3. Functions Related to the DC Controller PCB


<M> DC-CON
<S> 1/4
<R> READY
<P> READY
<F> USER
DISP
COUNTER
RAM-CLR
CHK-SUM
ADJUST
DCCON-1
xxxx
DCCON-2
xxxx
FUNC
OPTION
TEST


<M> DC-CON
<S> 2/4
<R> READY
<P> READY
<F> USER
DISP
COUNTER
B5-C1
xxxx
STMTR-C2
xxxx
STMTR-C3
xxxx
STMTR-C4
xxxx
A5R-MF
xxxx
ADJUST
A4-C1
xxxx
A4R-C2
xxxx
A4R-C3
xxxx
A4R-C4
xxxx
A4R-MF
xxxx
FUNC
A4-MF
xxxx
OPTION
TEST
SEND


<M> DC-CON
<S> 3/4
<R> READY
<P> READY
<F> USER
DISP
COUNTER
SGNL-M
xxxx
SGNL-C
xxxx
SGNL-Y
xxxx
SGNL-K
xxxx
SGNL-D
xxxx
ADJUST
REF-M
xxxx
REF-C
xxxx
REF-Y
xxxx
REF-K
xxxx
REF-D
xxxx
FUNC
SGAIN-M
xxxx
SGAIN-C
xxxx
SGAIN-Y
xxxx
SGAIN-K
xxxx
OPTION
RGAIN-K
xxxx
TEST
PT-OFST
xxxx
SEND


<M> DC-CON
<S> 4/4
<R> READY
<P> READY
<F> USER
DISP
COUNTER
EPOTOFST
xxxx
ADJUST
ATT-T-A
xxxx
ATT-T-B
xxxx
RG-XA
xxxx
RG-XB
xxxx
RG-Y
xxxx
FUNC
TR-DELAY
xxxx
OPTION
TR-FAST
xxxx
TEST
SEND

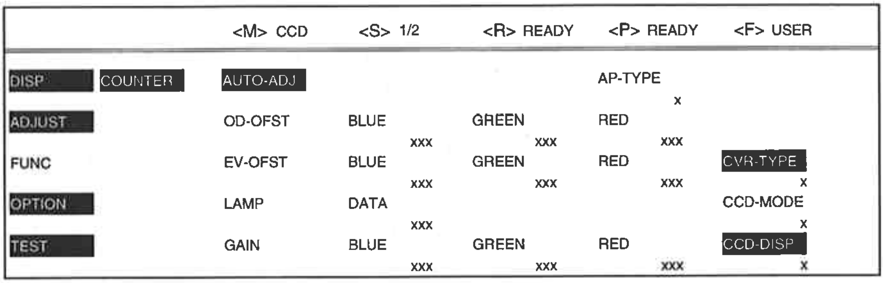
Entering Backup Data

You must enter the data recorded on the label shown in Figure 3-1102 using this screen whenever you have replaced the DC controller PCB.

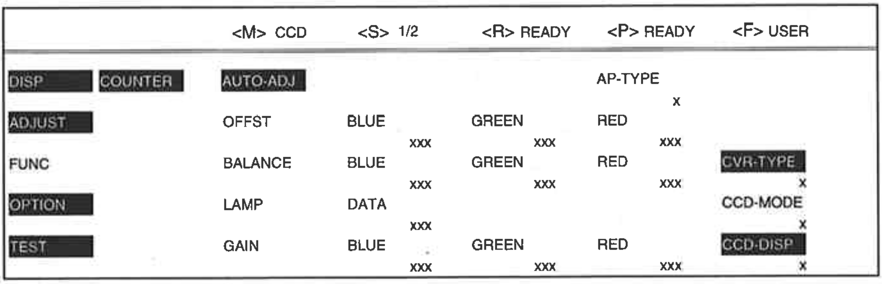
Item	Description	Remarks
RAM-CLR	Use it to clear RAM on the DC controller PCB and to set the standard settings.	
CHK-SUM	Use it to start checking the ROM on the DC controller PCB (by totaling the RAM data).	
DCCON-1	Indicates the check sum value of IC104 on the DC controller PCB.	
DCCON-2	Not used.	
B5-C1	Use it to enter the adjustment value of the paper width detection reference point 1 for the cassette 1.	
A4-C1	Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 1.	
STMTR-C2	Use it to enter the adjustment value of the paper width detection reference point 1 for the cassette 2.	If CLC800, no indication.
A4R-C2	Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 2.	
STMTR-C3	Use it to enter the adjustment value of the paper width detection reference point for the cassette 3.	If CLC700, no indication.
A4R-C3	Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 3.	
STMTR-C4	Use it to enter the adjustment value of the paper width detection reference point 1 for the cassette 4.	If CLC700, no indication.
A4R-C4	Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 4.	
A6R-MF	Use it to enter the adjustment value of the paper width reference point 1 for the multifeeder.	
A4R-MF	Use it to enter the adjustment value of the paper width detection reference point 2 for the multifeeder.	
A4-MF	Use it to enter the adjustment value of the paper width detection reference value 3 fort the multifeeder.	
SEND	Use it to transfer the image data of the screen on display to the reader controller.	
SGNL-M SGNL-C SGNL-Y SGNL-K	Use it to enter the toner density signal.	
SGNL-D	Use it to enter the value of the toner density signal at time of correction for the window soiling.	

Item	Description	Remarks
REF-M REF-C REF-Y REF-K	Use it to enter the value of the toner density reference signal.	
REF-D	Use it to enter the value of the toner density reference signal at time of correction for the window soiling.	
SGAIN-M SGAIN-C SGAIN-Y SGAIN-K	Use it to enter the gain for the toner density signal at time of toner density control.	
RGAIN-K	Use it to enter the value of the gain for the toner density reference signal at time of toner density control.	
PT-OFST	Enter the correction value for the laser output for BK ATR.	
SEND	Use it to transfer the data of the screen on display to the DC controller PCB. When service mode is ended, the copy that follows will reflect the transferred data.	
EPOTOFST	Use it to enter the potential offset value.	
ATT-T-A	Use it to enter the adjustment value of the side A retention timing for the transfer drum.	
ATT-T-B	Use it to enter the adjustment value of the side B retention timing for the transfer drum.	
RG-XA	Use it to enter the registration adjustment value of the side A sub scanning direction (paper feeding direction) for the transfer drum.	
RG-XB	Use it to enter the registration adjustment value of the side B sub scanning direction (paper feeding direction) for the transfer drum.	
RG-Y	Use it to enter the registration adjustment value of the main scanning direction (drum axial direction) for the transfer drum.	
TR-DELAY	Use it to enter the adjustment value of the point of transfer.	
TR-FAST	Enter the value used when changing the trailing edge margin.	-127~127 Unit: 0.1mm See “Changing the Image Trailing Edge Margin.”
SEND	Use it to transfer the data of the screen on display to the reader controller PCB. When service mode is ended, the copy that follows will reflect the transferred data.	

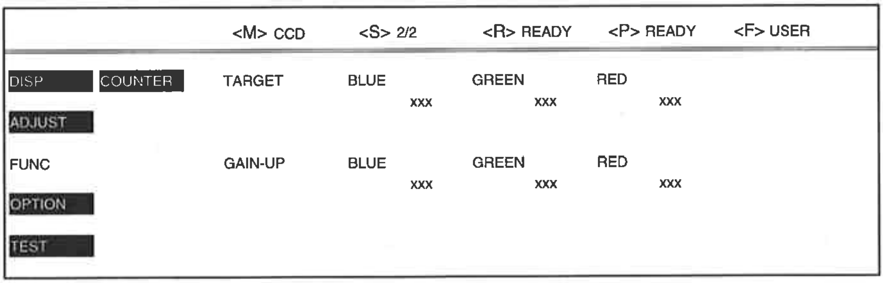
4. Making CCD-Related Adjustments



```
                    <M> CCD     <S> 1/2     <R> READY     <P> READY     <F> USER

DISP    COUNTER     AUTO-ADJ                              AP-TYPE
                                                                x
ADJUST              OD-OFST     BLUE        GREEN         RED
                                      xxx           xxx           xxx
FUNC                EV-OFST     BLUE        GREEN         RED           CVR-TYPE
                                      xxx           xxx           xxx          x
OPTION              LAMP        DATA                                    CCD-MODE
                                      xxx                                      x
TEST                GAIN        BLUE        GREEN         RED           CCD-DISP
                                      xxx           xxx           xxx          x
```



```
                    <M> CCD     <S> 1/2     <R> READY     <P> READY     <F> USER

DISP    COUNTER     AUTO-ADJ                              AP-TYPE
                                                                x
ADJUST              OFFST       BLUE        GREEN         RED
                                      xxx           xxx           xxx
FUNC                BALANCE     BLUE        GREEN         RED           CVR-TYPE
                                      xxx           xxx           xxx          x
OPTION              LAMP        DATA                                    CCD-MODE
                                      xxx                                      x
TEST                GAIN        BLUE        GREEN         RED           CCD-DISP
                                      xxx           xxx           xxx          x
```



```
                    <M> CCD     <S> 2/2     <R> READY     <P> READY     <F> USER

DISP    COUNTER     TARGET      BLUE        GREEN         RED
                                      xxx           xxx           xxx
ADJUST

FUNC                GAIN-UP     BLUE        GREEN         RED
                                      xxx           xxx           xxx
OPTION

TEST
```

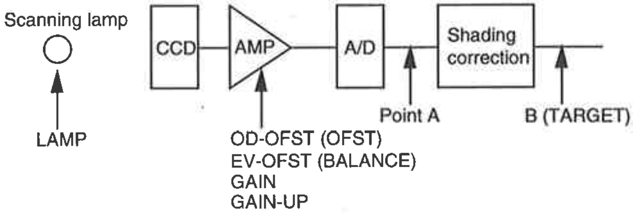
Item	Description	Remarks
AUTO-ADJ	Use it to start automatic adjustment. The bar code data on the standard white plate is read and offset-adjustment, scanning lamp intensity adjustment, and gain adjustment are executed in sequence.	Adjustments are made so that the value of point A is the setting obtained from the bar code data.
AP-TYPE	Use it to indicate the version of the analog processor PCB. 0: old type 1: new type	

Item		Description	Remarks
OD-OFST		Use it to indicate the value of the offset level for the odd bits of the CCD.	Be sure to copy the values on the service label attached to the cover of the DC controller PCB.
	BLUE	Use it to indicate the data of BLUE for the offset level.	
	GREEN	Use it to indicate the data for GREEN for the offset level.	
	RED	Use it to indicate the data for RED for the offset level.	
EV-OFST (AP-TYPE=0)		Use it to indicate the value of the offset level for the even bits of the CCD.	
	BLUE	Use it to indicate the data for BLUE for the offset level.	
	GREEN	Use it to indicate the data for GREEN for the offset level.	
	RED	Use it to indicate the data for RED for the offset level.	
LAMP		Use it to indicate the level adjustment value for the scanning lamp.	
DATA		Use it to indicate the level data for the scanning lamp.	
OFFSET (AP-TYPE=1)		Use it to indicate the offset level adjustment value for the odd bits of the CCD.	
	BLUE	Use it to indicate the data for BLUE for the offset level.	
	GREEN	Use it to indicate the data for GREEN for the offset level.	
	RED	Use it to indicate the data for RED for the offset level.	
BALANCE (AP-TYPE=1)		Use it to indicate the balance level adjustment value for the even bits and the odd bits of the CCD.	
	BLUE	Use it to indicate the data for BLUE for the balance level.	
	GREEN	Use it to indicate the data for GREEN for the balance level.	
	RED	Use it to indicate the data for RED for the balance level.	

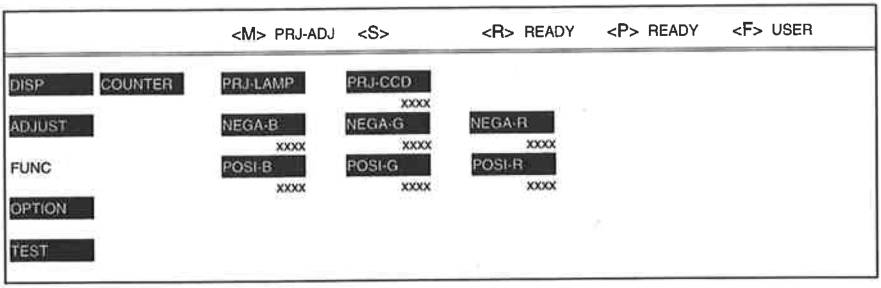
Item		Description	Remarks
GAIN		Use it to indicate the gain level adjustment value for the CCD.	
	BLUE	Use it to indicate the data for BLUE for the gain level.	
	GREEN	Use it to indicate the data for the GREEN for the gain level.	
	RED	Use it to indicate the data for the RED for the gain level.	
TARGET		Use it to indicate the shading adjustment correction value (target value for pint B).	Be sure to record the values on the service level attached to the cover of the DC controller PCB.
	BLUE	Use it to indicate the data for BLUE.	
	GREEN	Use it to indicate the data for GREEN.	
	RED	Use it to indicate the data for RED.	
CVR-TYPE (See note)		Use it to enter the version of the CVR. 0: old type 1: new type	
CCD-MODE		Use it to check the result of 'AUTO-ADJ', i.e., normal or precious metal mode.	0: normal 1: precious metal
CCD-DISP		Use it to switch the data display of the CCD screen.	0: normal 1: precious metal
GAIN-UP		Use it to check which mode is effective, i.e., gain-up or normal. gain up: 255 normal: 0	In gain-up mode, the gain will be double that of normal mode.
	BLUE	Use it to indicate the data for BLUE.	
	GREEN	Use it to indicate the data for GREEN.	
	RED	Use it to indicate the data for RED.	

Note 1:

The value of the item returns to its standard value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.



5. Adjusting the Projector



<M> PRJ-ADJ <S> <R> READY <P> READY <F> USER

DISP COUNTER PRJ-LAMP PRJ-CCD xxxx

ADJUST NEGA-B xxxx NEGA-G xxxx NEGA-R xxxx

FUNC POSI-B xxxx POSI-G xxxx POSI-R xxxx

OPTION

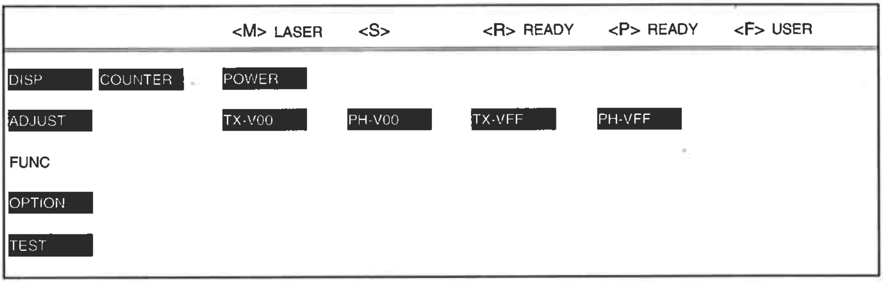
TEST

Item	Description	Settings
PRJ-LAMP	Use it to keep the lamp of the film projector on for 1 min. (Press 'PRJ-LAMP' to turn it off.)	
PRJ-CCD	Use it to adjust the gain of the CCD at time of installation and to read data.	
NEGA-B NEGA-G NEGA-R (See note)	Use it to adjust the target value for shading correction when copying negative film using the film projector. • A higher setting increases the density B → Y G → M R → C	–100 ~ +100
POSI-B POSI-G POSI-R	Use it to adjust the target value for shading correction used when making positive film with the film projector in use. • A lower setting for the following darkens the images: B → Y G → M R → C	–100 ~ +100

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

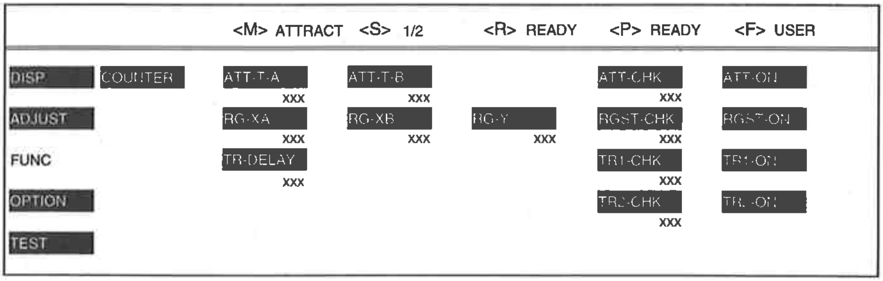
6. Adjusting the Laser

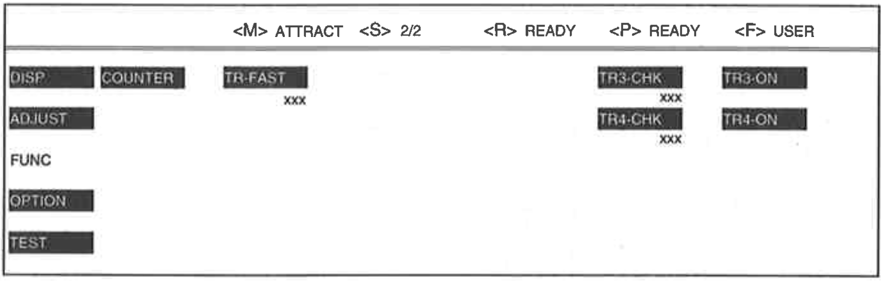


```
                         <M> LASER   <S>         <R> READY   <P> READY   <F> USER

DISP       COUNTER       POWER

ADJUST                   TX-V00      PH-V00      TX-VFF      PH-VFF

FUNC

OPTION

TEST
```

Item	Description	Remarks
POWER	Use it to turn on the laser output for adjusting the laser power.	Press 'STOP' to turn it off.
TX-V00	Use it to turn on the laser output for V00 to check V00 for text mode.	
PH-V00	Use it to turn on the laser output for V00 to check V00 for photo mode.	
TX-VFF	Use it to check the laser output for V00 to check VFF for text mode.	
PH-VFF	Use it to turn on the laser output to for V00 to check VFF in photo mode.	

7. Adjusting the Point of Retention

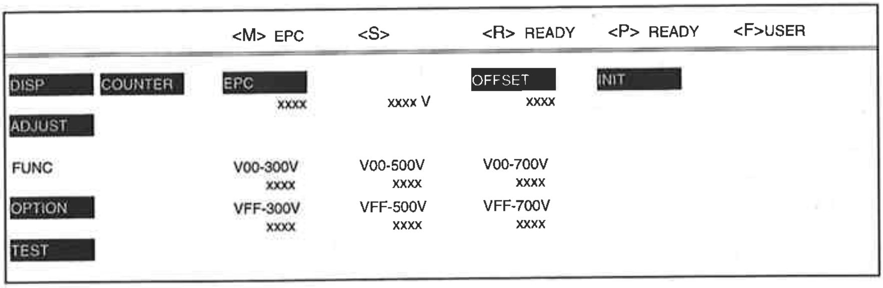

<M> ATTRACT <S> 1/2 <R> READY <P> READY <F> USER
DISP
COUNTER
ATT-T-A
xxx
ATT-T-B
xxx
ATT-CHK
xxx
ATT-ON
ADJUST
RG-XA
xxx
RG-XB
xxx
RG-Y
xxx
RGST-CHK
xxx
RGST-ON
FUNC
TR-DELAY
xxx
TR1-CHK
xxx
TR1-ON
OPTION
TR2-CHK
xxx
TR2-ON
TEST


<M> ATTRACT <S> 2/2 <R> READY <P> READY <F> USER
DISP
COUNTER
TR-FAST
xxx
TR3-CHK
xxx
TR3-ON
ADJUST
TR4-CHK
xxx
TR4-ON
FUNC
OPTION
TEST

Item	Description	Remarks
ATT-T-A	Use it to enter the timing of retention of copy paper to side A of the transfer drum.	Unit: 0.1 mm
ATT-T-B	Use it to enter the timing of retention of copy paper to side B of the transfer drum.	Unit: 0.1 mm
ATT-CHK	Use it to specify the point of retention on the transfer drum. 1: Double-side retention (side B, side A) 2: Side A retention 3: Side B retention	
ATT-ON	Use it to execute retention of copy paper to the transfer drum. Attracts copy paper to the transfer drum. The paper is picked up from cassette 1; therefore, 'NO PAPER' will appear under <P> on the display if cassette 1 is out of paper; the notation returns to 'READY' when paper has been supplied.	
RG-XA	Use it to enter the fine-adjustment value of the point of retention in X direction (paper feeding direction) on side A of the transfer drum.	Unit: 0.1 mm
RG-XB	Use it to enter the fine-adjustment value of the point of retention in X direction (paper feeding direction) on side B of the transfer drum.	Unit: 0.1 mm

Item	Description	Remarks
RG-Y	Use it to enter the fine-adjustment value of the point of retention in the Y direction (drum axial direction) of the transfer drum.	
RGST-CHK	Use it to specify the mode for 'RGST-ON' operation. 1: Double-sided retention (side B, side A) 2: Side A retention 3: Side B retention	
RGST-ON	Use it to generate a cyan mono print. The side (A or B) will be indicated on the print face.	
TR-DELAY	Use it to enter the fine-adjustment value of the point of transfer.	
TR1-CHK	Use it to specify the mode for 'TR1-ON' operation. 1: Double-side retention (side B, side A) 2: Side A retention 3: Side B retention	
TR1-ON	Use it to adjust to a leading margin of 1 mm; see Figure 2-16 in Service Handbook for an output sample.	
TR2-CHK	Use it to specify the mode for 'TR2-ON' operation. 1: Double-side retention 2: Side A retention 3: Side B retention	
TR2-ON	Use it to check the leading edge margin (8 mm); see Figure 2-16 in Service Handbook for an output print.	
TR-FAST	Use it to set the appropriate transfer high-voltage trailing edge control value to accommodate a trailing edge margin of 2.5 mm.	See "Changing the Image Trailing Edge Margin."
TR3-CHK	Use it to select the appropriate mode for 'TR3-ON'. 1: 2-sheet retention (side B, side A) 2: side A retention 3: side B retention	
TR3-ON	Use it to generate a test print for checking the TR-FAST adjustment value.	
TR4-CHK	Use it to select the appropriate mode for 'TR4-ON'. 1: 2-sheet retention (side B, side A) 2: side A retention 3: side B retention	
TR4-ON	Use it to generate a test print for checking the trailing edge of 2.5 mm.	

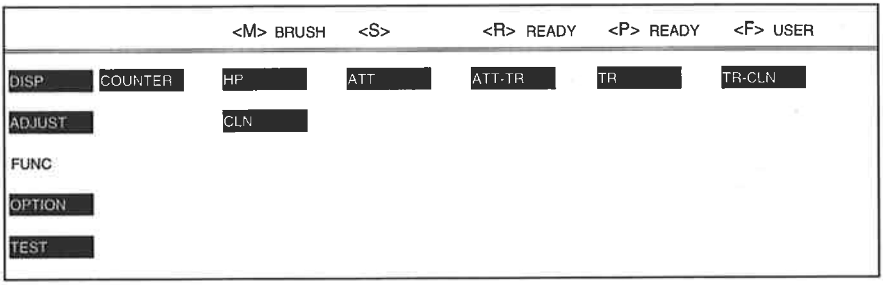
8. Measuring the Photosensitive Drum Potential



```
                        <M> EPC      <S>          <R> READY    <P> READY    <F>USER
DISP    COUNTER         EPC                       OFFSET       INIT
                           xxxx      xxxx V          xxxx
ADJUST
FUNC                    V00-300V     V00-500V     V00-700V
                           xxxx         xxxx         xxxx
OPTION                  VFF-300V     VFF-500V     VFF-700V
                           xxxx         xxxx         xxxx
TEST
```

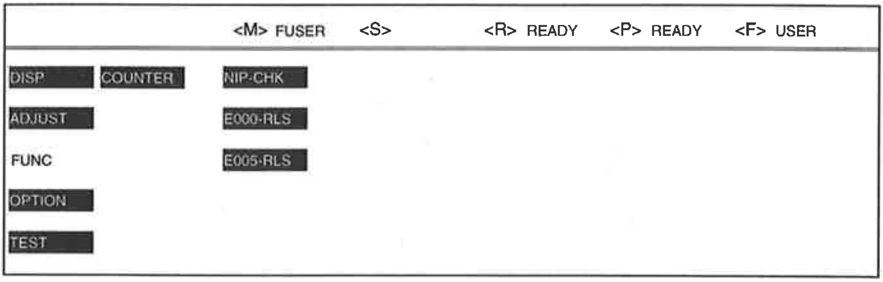
Item	Description	Remarks
EPC	Use it to measure the photosensitive drum potential.	The potential measurement data will be used for the next copying operation.
OFFSET	Use it to execute offset adjustment for the potential measuring PCB of the photosensitive drum.	The potential measurement data will be used for the next copying operation.
INIT	Use it to initialize the potential measurement data for the photosensitive drum.	Be sure to set 'PASCAL' under 'ADJUST to '0' when executing this mode.
V00-300V	Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 300 V and the laser output is V00.	guide: 280 ~ 380
V00-500V	Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 500 V and the laser output is V00.	guide: 480 ~ 620
V00-700V	Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 700 V and the laser output is V00.	guide: 680 ~ 860
VFF-300V	Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 300 V and the laser output is VFF.	guide: 35 ~ 145
VFF-500V	Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 500 V and the laser output is VFF.	guide: 40 ~ 190
VFF-700V	Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 700 V and the laser output is VFF.	guide: 45 ~ 235

9. Transfer/Retention Brush Functions



Item	Description	Remarks
HP	Use it to rotate the brush drive motor, thereby causing a move to the home position.	
ATT	Use it to rotate the brush drive motor, thereby causing a move to the point of retention (retention brush engagement position).	
ATT-TR	Use it to rotate the brush drive motor, thereby causing a move to the point of retention/transfer (retention brush and transfer brush).	
TR	Use it to rotate the brush drive motor, thereby causing a move to the point of transfer (transfer brush engagement position).	
TR-CLN	Use it to rotate the brush drive motor, thereby causing a move to the point of transfer/transfer cleaning, i.e., transfer brush and cleaning push-on brush engagement position.	
CLN	Use it to rotate the brush drive motor, thereby causing a move to the point of transfer cleaning (cleaning push-on brush engagement position).	

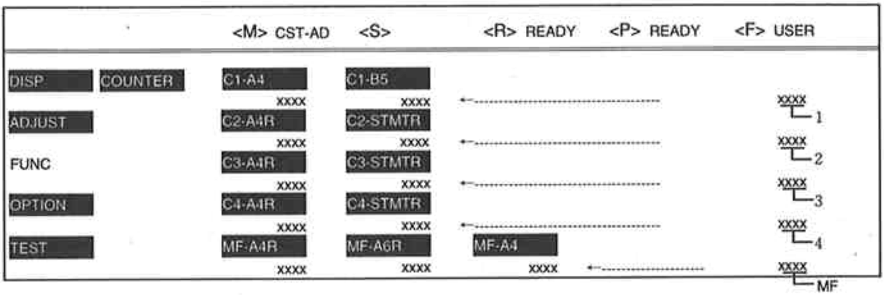
10. Functions Related to the Fixing Assembly



```
                    <M> FUSER   <S>        <R> READY   <P> READY   <F> USER

DISP      COUNTER   NIP-CHK

ADJUST              E000-RLS

FUNC                E005-RLS

OPTION

TEST
```

Item	Description	Remarks
NIP-CHK	Measuring the Fixing Nip Stops copy paper at a specific point and discharges it. The paper is picked up from cassette 1; therefore, 'NO PAPER' will appear under <P> on the display if cassette 1 is out of paper; the notation returns to 'READY' when paper has been supplied.	Press 'NIP-CHK' to execute. <P> changes from 'READY' to 'SERVICE and then to 'READY'.
E000-RLS	Clearing E000 Be sure to turn the power switch off and then on after execution.	The indication for <P> changes from 'ERROR' to 'SERVICE' and then to 'ERROR'. Turn off and then on the power switch to clear.
E005-RLS	Clearing E005 Be sure to turn off and on the power switch after execution.	

11. Adjusting the Cassette Paper Width

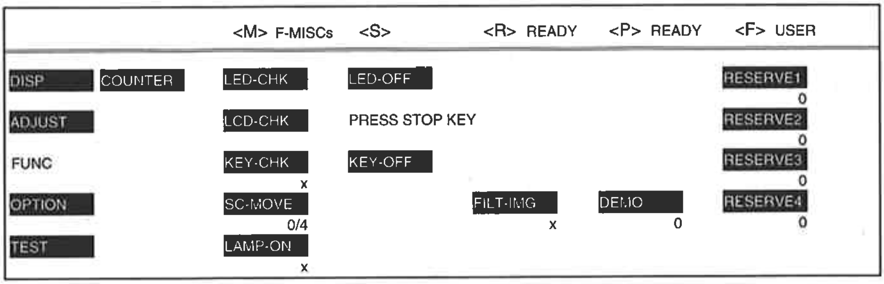


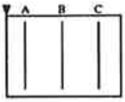
See the descriptions in "5. Storing the Cassette/Multifeeder Basic Settings" under "B. Electrical" of "II. Standards and Adjustments."

Item	Description	Remarks
C1-A4	Use it to execute automatic adjustment of the paper width reference 2 of the cassette 1.	
C1-B5	Use it to execute automatic adjustment of the paper width reference 1 of the cassette 1.	
C2-A4R	Use it to execute automatic adjustment of the paper width reference 2 of the cassette 2.	If CLC800, no indication.
C2-STMTR	Use it to execute automatic adjustment of the paper width reference 1 of the cassette 2.	
C3-A4R	Use it to execute automatic adjustment of the paper width reference 2 of the cassette 3.	If CLC700, no indication.
C3-STMTR	Use it to execute automatic adjustment of the paper width reference 1 of the cassette 3.	
C4-A4R	Use it to execute automatic adjustment of the paper width reference 2 of the cassette 4.	If CLC700, no indication.
C4-STMTR	Use it to execute automatic adjustment of the paper width reference 1 of the cassette 4.	
MF-A4R	Use it to execute automatic adjustment of the paper width reference 2 of the multifeeder.	
MF-A6R	Use it to execute automatic adjustment of the paper width reference 1 of the multifeeder.	
MF-A4	Use it to execute automatic adjustment of the paper width reference 3 of the multifeeder.	

Item	Description	Remarks
xxxx 1	Indicates the AD conversion value of the paper width detection reference point of the cassette 1.	
xxxx 2	Indicates the AD conversion value of the paper width detection reference point of the cassette 2.	If CLC800, no indication.
xxxx 3	Indicates the AD conversion value of the paper width detection reference point of the cassette 3.	If CLC700, no indication
xxxx 4	Indicates the AD conversion value of the paper width detection reference point of the cassette 4.	
xxxx ....MF	Indicates the AD conversion value of the paper width detection reference of the multifeeder.	

12. Functions/Inspections Related to the Reader Unit


<M> F-MISCs
<S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
LED-CHK
LED-OFF
RESERVE1
0
ADJUST
LCD-CHK
PRESS STOP KEY
RESERVE2
0
FUNC
KEY-CHK
KEY-OFF
RESERVE3
x
0
OPTION
SC-MOVE
FILT-IMG
DEMO
RESERVE4
0/4
x
0
0
TEST
LAMP-ON
x

Item	Description	Remarks
LED-CHK	Use it to start checking LED activation.	
LED-OFF	Use it to end checking LED activation.	
LCD-CHK	Use it to start LCD activation. (Highlights the key.)	To end checking, press the Stop key.
KEY-CHK	Use it to start checking the KEY input. (See descriptions on 'KEY-CHK'.)	Indicates the number/ name of the input key.
KEY-OFF	Use it to end checking the KEY input.	
SC-MOVE	Starts checking the scanner. Each press on 'SC-MOV' causes the following indications and operations: Indication / Operation 0/4 / HP → A 1/4 / HP → B 2/4 / HP → C 3/4 / HP	
FILT-IMG	Use it to check the output of each CCD (RGB). Place a color original on the copyboard glass, and press the Copy Start key; the output of each CCD (RGB) is printed on separate sheets in cyan mono. After making copies, the execution ends automatically.	Each press on the key changes the intensity data to '00' and '80'.

<table>
<tr><th>Item</th><th>Description</th><th>Remarks</th></tr>
<tr><td>LAMP-ON</td><td>Starts checking the scanning lamp. Each press on 'LAMP-ON' causes the following indications and operations:<table><tr><th>Indication</th><th>Operation</th></tr><tr><td>0 → 1
1 → 0</td><td>Turns on at intensity data 80 (light)
Turns on at intensity data 00 (dark)</td></tr></table></td><td>Each press on the key changes the intensity data to '00' and '80'.</td></tr>
<tr><td>DEMO</td><td>For R&D (not used)</td><td></td></tr>
<tr><td>RESERVE 1~4</td><td>For R&D (not used)</td><td></td></tr>
</table>

<Details of 'KEY-CHK'.>

Key	Key name
0 through 9	0 ~ 9
Reset	RESET
Stop	STOP
Two-Sided	A
One-Touch Adjust	B
Color Adjust	C
Extended Zoom	D
Frame Erase	E
Color Create	F
Page Separate	G
Image Create	I
Marker	J
Synthesis	L
User Mode	M
OHP Interleaf	O
Start	START
Pre-Heat	STAND BY
Interrupt	INTERRUPT
Cover	N
Area Specify	K
Shift	H
Start	START
Clear	CLEAR
ID	ID
Call	CALL

13. Functions/Inspection Related to the Printer Unit

		<M> F-MISCp	<S>	<R> READY	<P> READY	<F> USER
DISP	COUNTER	IO xxx	IO-ON			
ADJUST		SHV xxx	SHV-ON	MTR xxx	MTR-ON	SHUT-OFF
FUNC		FAN xxx	FAN-ON			
OPTION				BUFF xxx	BUFF-ON	
TEST		MF-PAD				

Item	Description	Remarks
IO	Use it to specify the type of I/O check.	See details.
IO-ON	Use it to start check on the I/O.	During operation, <P> SERVICE.
SHV	Use it to specify the type of check on the high-voltage output.	0 through 6 See the table on next page.
SHV-ON	Use it to start checks on the high-voltage output.	During operation, <P> SERVICE.
MTR	Use it to specify the type of checks on the motor.	00 through 18 See the table on next page.
MRT-ON	Use it to start checks on the motor.	During operation, <P> SERVICE.
SHUT-OFF	Executes an operation check for auto power-off.	During operation, <P> SERVICE.
FAN	Use it to specify the type of check on the fan.	00 through 19 See the table on next page.
FAN-ON	Use it to start checks on the fan.	During operation, <P> SERVICE.
BUFF	Use it to specify a stop position (length of advancement) for the pressure cam inside the buffer path. 1: 0 mm 2: 0.7 mm 3: 1.2 mm Enter a number using the keypad, and press the OK key to register.	
BUFF-ON	Use it to drive the buffer pass motor and the solenoid, thereby moving the cam to the specified position in 'BUFF'. After checking the operation, be sure to set 'BUFF' to '1' and execute 'BUFF-ON'.	After setting 'BUFF' to '1', be sure to turn off and then on the power.
MF-PAD	Executes aging for the manual feed pad of the multifeeder; i.e., rotates the multifeeder roller.	During operation, <P> SERVICE.

Reference

- You must execute 'MF-PAD' whenever you have replaced the manual feed pad of the multifeeder assembly.

- Details of IO

No		No	
40	oil removing roller solenoid (SL11)	75	developing M cylinder clutch (CL1)
42	decurling sheet solenoid (SL28)	76	Bk toner supply clutch (CL8)
43	fixing cleaning belt take-up solenoid (SL6)	77	Y toner supply clutch (CL7)
44	fixing cleaning belt releaisng solenoid (SL5)	78	C toner supply clutch (CL6)
45	delivery paper deflecting plate drive solenoid (SL20)	79	M toner supply clutch (CL5)
46	separation claw drive solenoid (SL8)	116	delivery vertical path roller 2 drive clutch (CL23)
48	duplexing pick-up assembly stopper plate solenoid (upper; SL27)	118	multifeeder pick-up solenoid (SL15)
49	duplexing pick-up assembly stopper plate solenoid (lower; SL27)	129	buffer solenoid 1
50	duplexing drive cluth (CL22)	130	buffer clutch 1
51	duplexing feeding roller solenoid (SL22)	133	pre-exposure lamp (LA2)
52	L paper deflecting plate drive solenoid (SL23)	144	transfer drum cleaner solenoid (SL14)
53	M paper deflecting plate drive solenoid (SL24)	147	registration roller releasing solenoid (SL9)
54	S paper deflecting plate drive solenoid (SL25)	148	registration roller drive clutch (CL9)
55	SS paper deflecting drive solenoid (SL26)	149	retention guide drive solenoid (SL10)
60	pre-registration roller 1 drive clutch (CL10)	150	transfer drum drive solenoid (SL13)
61	pre-registration roller 2 drive clutch (CL11)	155	duplexing pick-up assembly pick-up solenoid (SL21)
62	pick-up vertical path roller 1 clutch (CLC800; CL20)	156	cassette 4 pick-up solenoid (SL19)
63	pick-up vertical path roller 3 clutch (CL18)	157	cassette 3 pick-up solenoid (SL18)
64	pick-up vertical path roller 2 clutch (CL21)	158	cassette 2 pick-up solenoid (SL17)
65	pick-up vertical path roller 1 clutch (CLC700; CL15)	159	cassette 1 pick-up solenoid (SL16)
66	multifeeder pick-up clutch (CL12)	167	separation spacer push-up solenoid (SL7)
67	duplexing pick-up clutch (CL19)		
68	cassette 4 pick-up clutch (CL17)		
69	cassette 3 pick-up clutch (CL16)		
70	cassette 2 pick-up clutch (CL14)		
71	cassette 1 pick-up clutch (CL13)		
72	developing Bk cylinder clutch (CL4)		
73	developing Y cylinder clutch (CL3)		
74	developing C cylinder clutch (CL2)		

SHV in Detail

Type number	High-voltage	Description
0	—	High-voltage output absent.
1	Primary corona assembly, grid output	Photosensitive drum motor: on Pre-exposure: on Photosensitive drum: 1 rotation Primary output/grid output (550V): on (wait for stop, 10 rotations of photosensitive drum) Primary output/grid output (500V): off Photosensitive drum: 1 rotation Pre-exposure: off Photosensitive drum motor: off
2	Primary corona assembly, grid output, retention, transfer, internal static eliminator output, external static eliminator output	Photosensitive drum motor: on Pre-exposure lamp: on Photosensitive drum: 1 rotation Primary corona assembly/grid output (500V): on Transfer drum: engaged Internal/External static eliminator output: on Retention/transfer corona output: on (wait for stop, 10 rotations of photosensitive drum) Retention/corona output: off Internal/external static eliminator output: off Thereafter, power-on sequence is executed. (multiple initial rotation, transfer drum/static eliminator sequence)
3	Primary corona assembly, grid output, M developing assembly output	Photosensitive drum: on Pre-exposure lamp: on Photosensitive drum: 1 rotation Primary corona assembly/grid output (500V): on M developing assembly: AC/DC on (wait for stop, 10 rotations of photosensitive drum) M developing assembly: disengaged (AC/DC off) Primary corona assembly output/grid output (500V): off Photosensitive drum: 1 rotation Pre-exposure: off Photosensitive drum motor: off

Type number	High-voltage	Description
4	Primary corona assembly, grid output, C developing assembly output	Photosensitive drum motor: on Pre-exposure: on Photosensitive drum: 1 rotation Primary corona assembly/grid output (500V): on M developing assembly: engaged (AC/DC on) (wait for stop, 10 rotations of photosensitive drum) M developing assembly: disengaged (AC/DC off) Primary corona assembly/grid bias (500V): off Photosensitive drum: 1 rotation Pre-exposure: off Photosensitive drum motor: off
5	Primary corona assembly, grid output, Y developing assembly output	Photosensitive drum motor: on Pre-exposure: on Photosensitive drum: 1 rotation Primary corona assembly output/grid output (500V): on Y developing assembly: engaged (AC/DC on) (wait for stop, 10 rotations of photosensitive drum) Y developing assembly: disengaged (AC/DC off) Primary corona assembly output/grid output (500V): off Photosensitive drum: 1 rotation Pre-exposure: off Photosensitive drum motor: off
6	Primary corona assembly, grid output, K developing assembly output	Photosensitive drum motor: on Pre-exposure: on Photosensitive drum: 1 rotation Primary output/grid output (500V): on K developing assembly: engaged (AC/DC on) (wait for stop, 10 rotations of photosensitive drum) K developing assembly: disengaged (AC/DC off) Primary corona assembly output, grid output (500V): off Photosensitive drum: 1 rotation Pre-exposure: off Photosensitive drum motor: off

- 'MTR in Detail

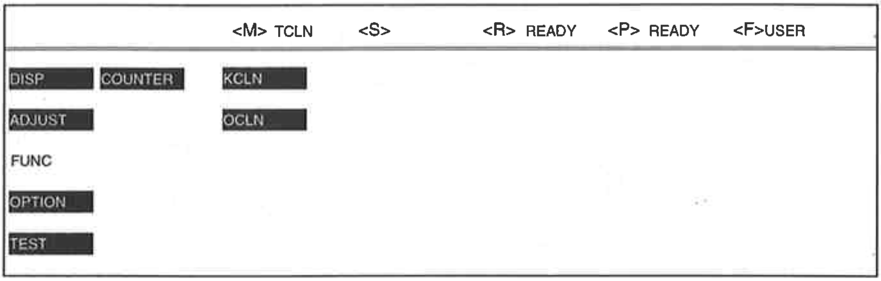
Type number	Motor	Description
00	M6 (pick-up motor)	Operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops.
02	M4 (main motor)	Operates for 120 sec, stops for 3 sec, and operates again for 10 sec, and then stops. (each drive clutch, off)
03	M8 (hopper motor)	Operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops. (each drive clutch, off)
04	M10 (transfer drum cleaner motor)	Operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops. (transfer drum cleaner not in contact with transfer drum)
05	M9 (cleaner assembly reciprocating motor)	Rotates the photosensitive drum motor at speed 1 (for plain paper); operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops. Stops the photosensitive drum motor.
06	M3 (laser scanner motor)	Operates for 10 sec, stops for 3 sec, and rotates continuously.
07	M5 (fixing motor)	Rotates for 10 sec in speed 1 (for plain paper), rotates for 10 sec in speed 2 (for plain paper 2 sides), rotates for 10 sec in speed 3 (for thick paper), rotates for 10 sec in speed 4 (for OHP), and then stops for 3 sec. The above operations are repeated three times.
08	M2 (photosensitive motor)	Rotates for 10 sec in speed 1 (for plain paper), rotates for 10 sec in speed 2 (for plain paper 2 sides), rotates for 10 sec in speed 3 (for thick paper), rotates for 10 sec in speed 4 (for OHP), and then stops for 3 sec. The above operations are repeated three times.
09	M7 (primary corona wire cleaning motor)	Executes 1 round-trip cleaning operation.

Type number	Motor	Description
16	M11 (brush drive motor)	Searches for home position. After the move to the point of retention, stops for 3 sec. After the move to the point of retention/transfer, stops for 3 sec. After the move to the point of transfer, stops for 3 sec. After the move to the point of transfer/push-on brush on position, stops for 3 sec. Searches for home position. The above operations are repeated twice.
17	M17 (duplexing unit reversing assembly switchback motor)	Executes pull-in operation for 3 sec (rotation at low speed). Executes pull-in operation for 3 sec (rotation at high speed). Executes feed-out operation for 3 sec (rotation). Stops for 3 sec. Executes pull-in operation for 3 sec (rotation at high speed). Executes feed-out operation for 3 sec (rotation). Stops
18	M16 (paper jogging guide drive motor)	Searches home position, and then stops for 3 sec. After the move to the A4 position, stops for 3 sec. After the move to the B4 position, stops for 3 sec. After the move to the A4R position, stops for 3 sec. After the move to the B5R position, searches home position.

FAN in Detail

Type number	Fan	Description
00	FM15 (feeding fan 2)	Operates for 5 sec, stops for 5 sec, and operates again for 5 sec, and then stops.
01	FM14 (feeding fan 1)	Operates for 5 sec, stops for 5 sec, and operate for 5 sec, and then stops.
02	FM2 (primary corona assembly fan)	Operates for 5 sec, stops for 5 sec, and operates continuously.
03	FM4 (ozone suction fan 1)	Operates for 5 sec, stops for 5 sec, and then operates continuously.
04	FM13 (ozone suction fan 2)	Operates for 5 sec, stops for 5 sec, and operates continuously.
05	FM12 (developing bias power supply PCB cooling fan)	Operates for 5 sec, stops for 5 sec, and operates again for 5 sec, and then stops.
16	FM10 (electrical unit fan 1)	Operates for 5 sec (100%), and operates again for 5 sec (50%), and then stops; further, operates for 5 sec (100%), and operations again for 5 sec (50%), and then operates continuously.
18	FM9 (IP cooling fan)	Operates for 5 sec (100%), and operates again for 5 sec (50%), and then stops; further, operates for 5 sec (100%), and operations again for 5 sec (50%), and then operates continuously.
19	FM3 (fixing heat exhaust fan)	Operates for 5 sec (100%), and operates again for 5 sec (50%), and then stops; further, operates for 5 sec (100%), and operates again for 5 sec (50%), and then operates continuously.

14. Movement of the Polishing Roller/Oil Removing Roller



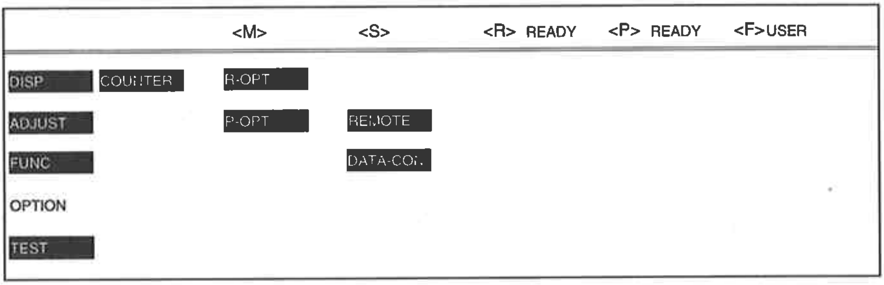
<M> TCLN <S> <R> READY <P> READY <F>USER

DISP COUNTER KCLN
ADJUST OCLN
FUNC
OPTION
TEST

Item	Description	Remarks
KCLN	The polishing roller is moved into contact and rotated while the transfer drum is rotating (about 3 min). During operation, '<P> SERVICE'.	The operation ends automatically after a specific period of time.
OCLN	The oil removing roller is moved into contact and rotated while the transfer drum is rotating (about 3 min). During operation, '<P> SERVICE'.	

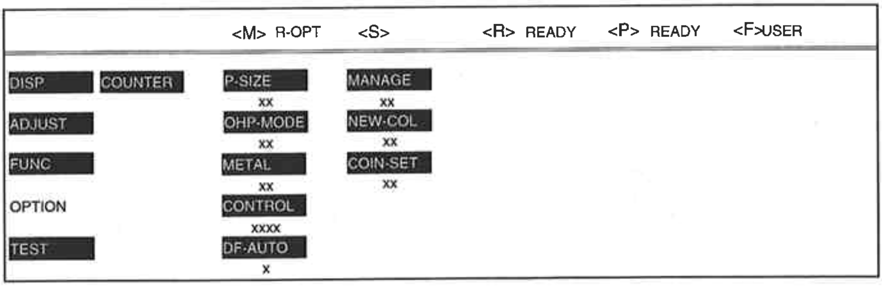
E. Machine Settings Mode (OPTION)

Setting Mode


<M>
<S>
<R> READY
<P> READY
<F>USER
DISP
COUNTER
R-OPT
ADJUST
P-OPT
REMOTE
FUNC
DATA-CON
OPTION
TEST

1	R-OPT	Use it to select machine settings related to the reader unit.
2	P-OPT	Use it to adjust the transfer drum stop position (cleaning mode).
3	REMOTE	Use it to set the parameters when an external controller is connected.
4	DATA-CON	Use it to note that a connection is made to the Copy Data Controller A1.

1. Machine Settings Mode (reader unit)



<table>
<tr><th>Item</th><th>Description</th><th>Remarks</th></tr>
<tr><td>P-SIZE
(See note)</td><td>Use it cause the machine to identify the size of copy paper and transparencies.</td><td>0: AB
1: inch
2: A
3: all</td></tr>
<tr><td>OHP-MODE
(See note)</td><td>Use it to select the maximum density of the copy image on transparencies.
0: Dmax=1.3
1: Dmax=1.7</td><td>settings: 0 to 3
standard: 0
However only '0' and '1' are enabled at present.</td></tr>
<tr><td>METAL
(See note)</td><td>Use it to specify whether to use 'precious metal mode' or not in user mode.</td><td>0: enable
1: disable</td></tr>
<tr><td>CONTROL</td><td>You may permit copying, printing, or scanning operation with conditions by changing the low-order three digits in the absence of a control key, control card, or ID number.
For instance, if 'CONTROL' is set to '002', in the absence of a control key you may use the IPU1 protocol to generate black-and-white/color printouts, use the IPU2 protocol to generate black-and-white/color printouts, use the IPU1 protocol to initiate scanning, or use the IPU2 protocol to initiate scanning.

Releasing with Control Key Condition
<table>
<tr><th rowspan="2">1st digit of 'CONTROL'</th><th rowspan="2">B/W copy</th><th colspan="3">B/W print-out</th><th colspan="3">Color print-out</th><th colspan="3">Scanning</th></tr>
<tr><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th></tr>
<tr><td>0</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>—</td><td>×</td></tr>
<tr><td>1</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>2</td><td>×</td><td>○</td><td>×</td><td>○</td><td>○</td><td>×</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>3</td><td>○</td><td>×</td><td>×</td><td>○</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>4</td><td>○</td><td>○</td><td>×</td><td>○</td><td>○</td><td>×</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
</table>
Releasing with Control Card Condition
<table>
<tr><th rowspan="2">2nd digit of 'CONTROL'</th><th rowspan="2">B/W copy</th><th colspan="3">B/W print-out</th><th colspan="3">Color print-out</th><th colspan="3">Scanning</th></tr>
<tr><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th></tr>
<tr><td>0</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>—</td><td>×</td></tr>
<tr><td>1</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>2</td><td>×</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>3</td><td>○</td><td>×</td><td>×</td><td>○</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>4</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
</table></td><td>Note:
Controllers of IPU1 Protocol
IPU10, IPU10S, PS-IPU III (Ver. 1.0), Color Pass 1000 (Ver. 1.0), IPU II(CLC350/550 Board), PS-XJ (Step 1,2), Color Pass 2000/3000/4000 (Step 1,2)
Controllers of IPU2 Protocol
F/S III, PS-IPU III (Ver. 1.1), Color Pass 1000 (Ver. 1.1), IPU II (CLC700/800 Board), PS-XJ (Step 3), Color Pass 2000/3000/4000 (Step 3)</td></tr>
</table>

<table>
<tr><th>Item</th><th>Description</th><th>Remarks</th></tr>
<tr><td>CONTROL</td><td>Releasing with ID No. Condition
<table>
<tr><th rowspan="2">3rd digit of 'CONTROL'</th><th rowspan="2">B/W copy</th><th colspan="3">B/W print-out</th><th colspan="3">Color print-out</th><th colspan="3">Scanning</th></tr>
<tr><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th></tr>
<tr><td>0</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>—</td><td>×</td></tr>
<tr><td>1</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>2</td><td>×</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>3</td><td>○</td><td>×</td><td>×</td><td>○</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>4</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
</table>
○: permit.
×: prohibit.
IPU1: Controller of IPU1 protocol.
IPU2: Controller of IPU2 protocol.
PS-IPU: PS-IPU controller.</td><td></td></tr>
<tr><td>DF-AUTO</td><td>Use it to set auto start for RDF manual feeding.
0: w/ auto start
1: w/o auto start</td><td></td></tr>
<tr><td>MANAGE</td><td>Use it to simulate hues of offset printing.
0: standard
1: offset printing
If 'MANAGE' is set to '1', the offset Printing mode button will be indicated on the user mode screen.
If the value of 'OPTION' 'R-OPT' 'NEW-COL' is '1' and the value of 'MANAGE' is set to '1', set the value of 'ADJUST' 'COL-ADJ' 'P-ADJ' to M=0, C=0, Y=0, K=0.</td><td>Setting: 0,1
Standard: 0
For fine-adjusting hues, see the description of 'ADJUST' → 'COL-ADJ' →'P-TGL-M/C/Y/K' (service mode).</td></tr>
<tr><td>NEW-COL</td><td>Use it to improve reproduction of human skin tone.
0: standard
1: enhance
If the value of 'NEW-COL' is set to '0', set the value of 'REMOTE' 'OPTION' 'EM-TYPE' to '0'.</td><td>Setting: 0, 1
Standard: 1</td></tr>
<tr><td>COIN-SET</td><td>Use it to set coin operation mode (back-up).
0: standard, displays the standard screen (without a control card)
1: displays a screen with the message "Insert a coin."
2: displays a screen with the message "Insert a copying card."
In 1 or 2, no animation is used on the screen.</td><td>Setting: 0, 1, 2
Standard: 0</td></tr>
</table>

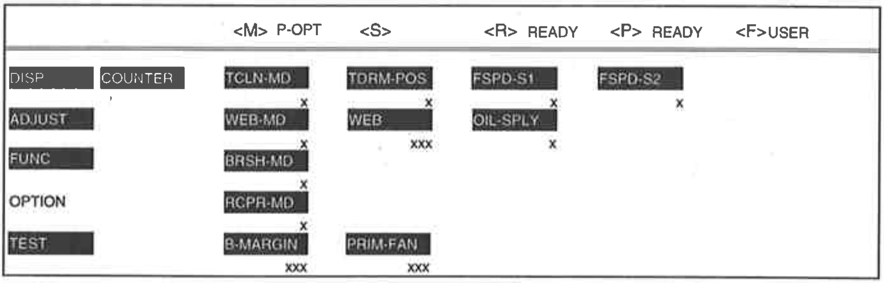
Note:

If you replaced a PCB or cleared a RAM, the values are reset to standard values, necessitating re-input. Make sure you record the items and the values whenever you must change the values on the service label in consideration of this.

Reference

An OHP projector may be a reflecting type or a transmitting type. If the installed projector is a transmitting type, the user can expect better results if the copy image maximum density is lower; select the appropriate setting according to the type of projector.

2. Setting Cleaning Mode/Transfer Drum Stop Position



Item	Description	Remarks
TCLN-MD	Use it to select the appropriate cleaning sequence for the transfer drum. 0: Cleaning for a single rotation of the transfer drum. 1: Cleaning for two rotations of the transfer drum.	Settings : 0,1
TDRM-POS	Use it to change the stop position of the transfer drum.	Settings : 0 ~ 4 Standard : 1
FSPD-S1	Use it to change the fixing speed for special paper 1. 0: normal (plain paper) 1: 2nd side in 2-sided copying (plain paper) 2: thick paper 3: special paper 2	Setting: 0 to 3 Standard: 1 During copying, the fixing web remains in contact.
FSPD-S2 (See note 2)	Use it to change the fixing speed for special paper 2. 0: normal (plain paper) 1: 2nd side in 2-sided copying (plain paper) 2: thick paper 3: special paper 2	Setting: 0 to 3 Standard: 3 During, copying, the fixing web remains off contact.
WEB-MD	Use it to change the on/off sequence of the cleaning belt solenoid. (At present, only '1' is available.)	Standard : 1
WEB (See note 1)	Use it to change the frequency at which the cleaning belt solenoid turns on. The notation 'x' represents the number of small-size copies; x=setting.	Settings : 1 ~ 255 Standard : 8
OIL-SPLY	Use it to switch oil supply. 0: by service person 1: by user When the oil starts to run out while the item is set to 'by user', the message "Supply Oil to Fixing Assembly" will be indicated on the control panel.	Setting: 0, 1 Standard: 1
BRSH-MD (See note 1)	Use it to change the sequence of engaging the attraction brush when thick LTRR paper is being fed. 0: engage the brush only when attraction charging is on. 1: engage the brush throughout copying sequence.	Settings : 0 ~ 3 Standard : 1 '2' and '3' are not used.

Item	Description	Remarks
RCPR-MD	Use it to set the functions for the reciprocating motor in the drum cleaning assembly. 2: do not perform reciprocating operation. 3: perform reciprocating operation only during last	Settings : 0 to 4 Standard : 3 Do not use a setting other than '3'.
B-MARGIN	Use it to change the trailing edge margin. 0: 4.5 mm 1: 2.5 mm	See "Changing the Image Trailing Edge Margin."
PRIM-FAN	Use it to select the on/off timing for the primary charging fan. 0: longer activation period for primary charging fan 1: shorter activation period for primary charging fan	Setting: 0, 1 Standard: 1

Note 1:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

Note 2:

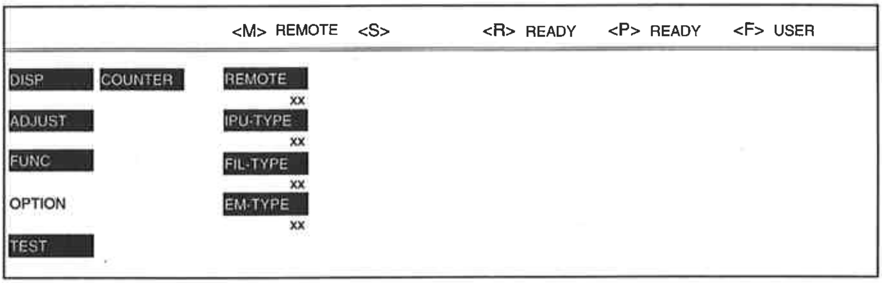
If lines of oil are noted in high-density areas when images are copied on cast-coated paper in thick mode,

1) Change the setting of 'FSPD-S2' under 'P-OPT' of 'OPTION' in service mode from '3' to '2'.
2) The label on the paper used wrap the sheets may recommend copying in thick paper mode; however, advise user to use special paper 2 mode after changing the setting.

Reference

- 'TCLN-MD' will prove effective when the backs of copies tend to become soiled.
- 'TDRM-POS' will prove effective when image faults are caused by residual memory on the drum.
- 'BRSH-MD' will prove effective when color displacement is noted when thick LTRR paper is fed.

3. Selecting Machine Specifications when Using an External Controller


<M> REMOTE <S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
REMOTE
xx
ADJUST
IPU-TYPE
xx
FUNC
FIL-TYPE
xx
OPTION
EM-TYPE
xx
TEST

Item	Description	Remarks
REMOTE	Enter settings for A, B, and C of the table below. A: Decides whether the Call key should be used as a Remote key or not; if not used as a Remote key, the IPU's operation command activates remote state and, after operation, restores local state. B: Decides whether a move from local state to remote state should be made and whether copy modes set in local state should be retained.	Settings : 0 ~ 7 Standard : 0
IPU-TYPE (See note)	Set it to match the external controller to be connected. 0: standard 1: PS-IPU Ⅲ Ver.1.0 only.	Settings : 0 to 1 Standard : 0
FIL-TYPE (See note)	Use it to select edge emphasis on the output image from the controller to prevent tapering of fine lines. 0: not used 1: standard	Settings : 0 to 1 Standard : 1

Item	Description	Remarks
EM-TYPE	Use it to emulate other models when using the IPU. 0: Value of 'OPTION' 'R-OPT' 'NEW-COL' is set to '0' 1: Value of 'OPTION' 'R-OPT' 'NEW-COL' is set to '1' ■ From the controller to the images, sets the value set by <ADJUST><COL-ADJ><P-ADJ> and <ADJUST><COL-ADJ><P-OFST>. ■ To the reader images, sets the value set by <ADJUST><COL-ADJ><COL-ADJ> and <ADJUST><COL-ADJ><OFST>. 2: Identical to the hue by the IPU10S/CLC800 when the IPU2 (native mode) is connected. ■ The following is set according to the gamma specified by the IPU2: • Switches the LOG table for the IPU. • Switches the masking coefficient. 3: Identical to the hue by the IPU10S/CLC500 when the IPU2 (native mode) is connected. ■ From the controller to the images, sets the value set by <ADJUST><COL-ADJ><P-ADJ> and <ADJUST><COL-ADJ><P-OFST>. ■ To the reader images, sets the value set by <ADJUST><COL-ADJ><COL-ADJ> and <ADJUST><COL-ADJ><OFST>. ■ The following is set according to the gamma specified by the IPU2: • Switches the LOG table for the IPU. • Switches the masking coefficient.	Settings: 0 to 3 Standard: 1

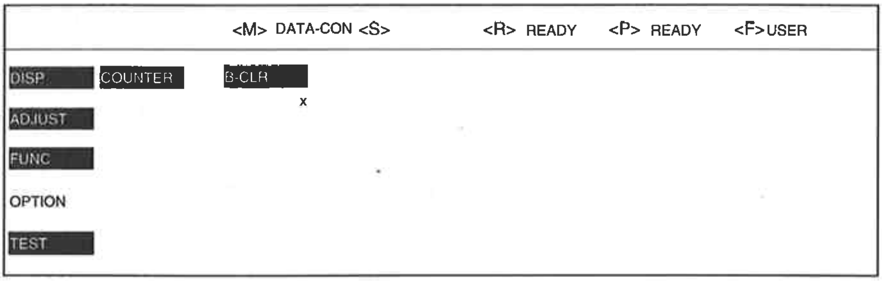
- **Detail of Settings**

Settings	A	B	C
REMOTE = 0,1	Call key	Retain	Local
2,3	Call key	Do not retain	Local
4,5	Remote key	Retain	Local
6,7	Remote key	Do not retain	Local

Note:

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

4. When Connected to the Copy Data Controller A1



<M> DATA-CON <S>　<R> READY　<P> READY　<F>USER

DISP　COUNTER　B-CLR

x

ADJUST

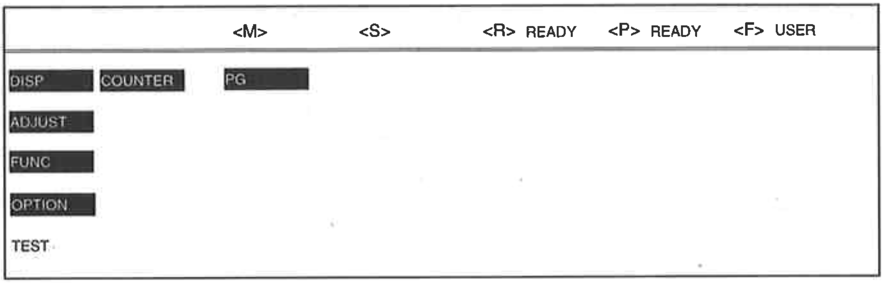
FUNC

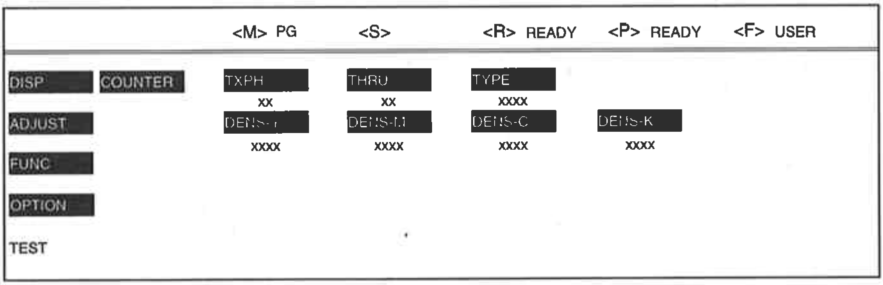
OPTION

TEST

Item	Description	Remarks
B-CLR	Use it to indicate whether the Copy Data Controller A1 is connected (recognition will be automatic). 0: Not connected 1: Connected If the setting is '1', an error code (E717) will be issued if the Copy Data Controller A1 is disconnected. To clear 'E717', • Press 'B-CLR'. • Initialize the RAM of the reader controller.	Setting: 0, 1 Standard: 0 As necessary, set it to '0' during service work so as to temporarily disconnect the Copy Data Controller A1.

F. Test Print


<M>
<S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
PG
ADJUST
FUNC
OPTION
TEST


<M> PG
<S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
TXPH
xx
THRU
xx
TYPE
xxxx
ADJUST
DENS-Y
xxxx
DENS-M
xxxx
DENS-C
xxxx
DENS-K
xxxx
FUNC
OPTION
TEST

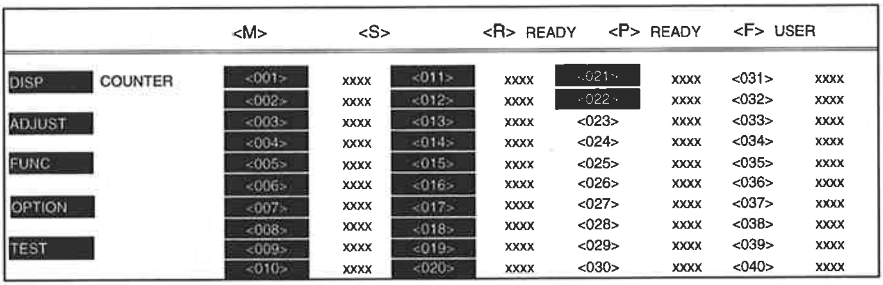
Be sure to return 'TYPE' to '0' when ending test print mode.

Item	Description	Remarks
TYPE	Specify the type of test print. 0 : image from CCD (normal copy) 1 : for R&D 2 : 256 colors 3 : 256 gradations 4 : 16 gradations 5 : entire face in halftone 6 : grid 7 : for R&D 1 8 : for R&D 2 9 : for R&D3 10 : MCYBk horizontal stripe (laser FF) 11 : for R&D 4 12 : YMCBk 64 gradations 13 : BGR 64 gradations 14 : full-color 16 gradations (YMCBk) 15 : full-color light area 16 gradations (YMCBk) 16 : MCYBk horizontal stripe (laser A0)	Enter a number using the keypad (1 through 16); then, press the Copy Start key to generate a test print. To specify the output color for 3, 4, 5, and 6, use color mode (user mode). • Be sure to return to '0' after generating a test print.
DENS-M/C/Y/K	PGTYPE=5 above: specifies the density of each color for full face in halftone.	0 through 255 standard: 128

Item	Description	Remarks
TXPH	Use it switch between text mode and photo mode. 0 : text mode 1 : photo mode Not effective if 'TYPE-6', i.e., grid.	Each press causes it to alternate between '0' and '1'.
THRU	Switches the gate array on the laser controller PCB. Not effective when 'TYPE' is set to '5' (halftone). This is invalid for TYPE5 (halftone). 0 : Use gate array. 1 : Do not use gate array.	

G. Counter

- After '999999', returns to '000000'.
- After pressing a sub item number (except 038, 039, 040) and the indication has reversed, a press on the Clear key causes the counter for the item to turn '000000'. (You cannot clear '014'; instead, clear '011', '012', and '013'.)
- Check the reading of '038' (3rd-level number) whenever you have replaced the cleaning belt for the fixing assembly; if not '0', press 'E005-RLS' of 'FUSER' under 'FUNC' to clear the counter reading.
- Further, executing 'RAM-CLR' for the reader controller PCB causes all sub items to be '00 0000' (except 038, 039, 040).



```
                 <M>          <S>          <R> READY    <P> READY    <F> USER

DISP    COUNTER  <001>  xxxx  <011>  xxxx  <021>  xxxx  <031>  xxxx
                 <002>  xxxx  <012>  xxxx  <022>  xxxx  <032>  xxxx
ADJUST           <003>  xxxx  <013>  xxxx  <023>  xxxx  <033>  xxxx
                 <004>  xxxx  <014>  xxxx  <024>  xxxx  <034>  xxxx
FUNC             <005>  xxxx  <015>  xxxx  <025>  xxxx  <035>  xxxx
                 <006>  xxxx  <016>  xxxx  <026>  xxxx  <036>  xxxx
OPTION           <007>  xxxx  <017>  xxxx  <027>  xxxx  <037>  xxxx
                 <008>  xxxx  <018>  xxxx  <028>  xxxx  <038>  xxxx
TEST             <009>  xxxx  <019>  xxxx  <029>  xxxx  <039>  xxxx
                 <010>  xxxx  <020>  xxxx  <030>  xxxx  <040>  xxxx
```

Item	Description	Item	Description
001	Number of times the Y developing assembly has been used.	013	Number of prints generated using the synthesis mechanism.
002	Number of times the M developing assembly has been used.	014	Number of total prints (copies, + prints, synthesized prints)
003	Number of times the C developing assembly has been used.	015	Number of sheets picked up from the cassette 1.
004	Number of times the K developing assembly has been used.	016	Number of sheets picked up from the cassette 3.
005	Number of Y mono copes.	017	Number of sheets picked up from the cassette 4.
006	Number of M mono copies made.	018	Number of sheets picked up from the multifeeder.
007	Number of C mono copies made.	019	Number of sheets picked up at the duplexing unit.
008	Number of K mono copies made.	020	Number of scans made by the scanning system.
009	Number of 3-color copies made.	021	Number of copies made using the film projector.
010	Number of 4-color copies made.	022	Number of sheets picked up from the RF.
011	Number of total copies made.	023	reserved
012	Number of total prints made.	024	reserved

Item	Description	Item	Description
025	reserved	038	Represents the number of times the solenoid turns on between detection of the absence of the web and indication of ‘E005’. (initially, 200; incremented by ‘1’ for each activation)
026	reserved		
027	reserved		
028	reserved		
029	reserved		
030	reserved	039	Represents the number of copies made until the primary corona wire automatic cleaning mechanism operates next time (initially, '2000': a single copy decreases the count by '1'; a 4C copy, by '4'; a 3C copy, by '3'; and a mono-C copy, by '1').
031	reserved		
032	reserved		
033	reserved		
034	reserved		
035	reserved	040	Represents the number of copies made until the polishing roller cleaning mechanism operates next time (initially, ‘1200’; decreased by 1 for copy).
036	reserved		
037	reserved		

H. Adjusting the Electrical system

(For descriptions on how to adjust the mechanical system, see P.4-105.)

The copier's major PCBs are equipped with variable resistors (VR), and all VRs are adjusted at the factory with high precision.

As a rule, do not touch those VRs not discussed herein in the field, as they require high precision.

1. After Replacing Major Parts

a. After Replacing the Developer (MCY)

1) Execute 'STIR' in service mode ('FUNC').
2) Have the machine read the toner density data using 'INIT-M, INIT-C, INIT-Y' under 'INSTALL' in service mode ('FUNC').
3) Record the result (those indicated by * in Figure 3-1104) on the service label.
4) Leave service mode, and turn off and then on the power switch.

b. After Replacing the Developer (Bk)

1) Execute 'STIR' in service mode ('FUNC').
2) Have the machine read the toner density data using 'INIT-K' under 'INSTALL' in service mode ('FUNC').
When 'INIT-K' ends, take notes of the value of 'SGNL-K'.
3) Select 'DC-CON' under 'FUNC', and enter a value obtained by adding '37' to the value you took note of in step 2) into 'SGNL-K'.
4) Press 'SEND', and leave service mode; then, turn off and then on the power switch.
If you have replaced all four colors, have the machine read the toner density data using 'INIT-4' under 'INSTALL' in service mode ('FUNC').

c. After Replacing the Developing Assembly (MCYK), Toner Density Sensor (MCY), or Black Toner Density Sensor

1) Replace the developer.
2) Go through steps under a. or b. above.

d. After Replacing the Photosensitive Drum Unit

1) After replacing the cleaning blade, apply lubricant.
2) Install the photosensitive drum.
3) Clean the window of the black toner density sensor (dry wiping) ; and apply lubricant to the No. 2 blade.
4) Replace the black developer.
5) Go through the steps under b. given for the replacement of the developer (Bk).

		TYP			
	B5-C1				
	A4-C1				
	STMTR-C2				
	A4R-C2				
	STMTR-C3				
	A4R-C3				
	STMTR-C4				
	A4R-C4				
	A5R-MF				
	A4R-MF				
	A4-MF				
•	SGNL-M				
•	SGNL-C				
•	SGNL-Y				
•	SGNL-K				
•	SGNL-D				
•	REF-M				
•	REF-C				
•	REF-Y				
•	REF-K				
•	REF-D				
•	SGAIN-M				
•	SGAIN-C				
•	SGAIN-Y				
•	SGAIN-K				
•	REFG-K				
	EPOT-OFST				
	ATT-T-A				
	ATT-T-B				
	RG-XA				
	RG-XB				
	RG-Y				
	TR-DELAY				
	BODY-NO				

FS5-8037

Figure 3-1104

	TYP		
CVR-TYPE			
ADJ-X			
ADJ-Y			
ADJ-S			
ED-ADJ-X			
ED-ADJ-Y			
ADJ-J			
EC-GLASS			
DA-XS			
DA-XE			
DA-YS			
DA-YE			
DS-DOC			
DS-PRJ			
DS-OHP			
ADJ-M			
ADJ-C			
ADJ-Y			
ADJ-K			

		TYP		
	OFST-M			
	OFST-C			
	OFST-Y			
	OFST-K			
	SEG-ADJ			
	BC-ADJ			
	LGCR-IPU			
*	LAMP-DT			
*	GAIN-B			
*	GAIN-G			
*	GAIN-R			
*	TARGET-B			
*	TARGET-G			
*	TARGET-R			

Figure 3-1105

e. After Replacing the DC Controller PCB

1) Replace the developer (all four colors), and execute 'STIR-4' and 'INIT-4' under 'INSTALL' in service mode ('FUNC').
2) Record the results (those indicated by * in Figure 3-1104) on the service label; however, for 'SGNL-K', record a value obtained by adding '37' to the result.
3) Enter the values recorded on the service label (those not indicated by *) using 'DC-CON' under 'FUNC'; however, for 'SGNL-K', enter the value recorded on the service label.
4) When you have pressed all values, turn off and then on the power switch.
5) Set 'PASCAL' under 'ADJUST' in service mode to '1'.

f. After Replacing the ROM on the DC Controller PCB

1) Execute 'RAM-CLR' under 'D-CON' in service mode ('FUNC').
2) Go through the steps under"e. After Replacing the DC Controller PCB," starting with step 2).

g. After Replacing the Reader Controller PCB

1) Enter the values recorded on the service label (those indicated by * in Figure 3-1105) using 'R-CON' under 'FUNC'.
2) Execute 'AUTO-ADJ' under 'CCD' in service mode ('FUNC'), and record the result (those indicated by * in Figure -3-1105) on the service label.
- If a projector is installed, execute 'PROJ-CCD' under 'PRJ-ADJ' in service mode ('FUNC').
3) When you have entered all the values, turn off and then on the power switch.

h. After Replacing the ROM on the Reader Controller PCB

1) Execute 'RAM-CLR' of 'R-CON' under 'FUNC' in service mode.
2) Go through the steps for "g.After Replacing the Reader Controller PCB" starting with step 1.

i. After Replacing the Laser Unit, Laser Controller PCB

1) Adjust the laser power.
2) Adjust the laser.
3) Replace the black developer.
4) Execute 'INIT-K' of 'INSTALL' under 'FUNC' in service mode to read the toner density data.

j. After Replacing the Scanning Lamp, Standard White Plate, Lamp Regulator, Lamp Reflecting Plate, or Analog Processor PCB

1) According to 'AUTO-ADJ' of 'CCD' under 'FUNC' in service mode, read in the data.

k. After Replacing the Transfer Drum

1) Execute the following in the order given in service mode:

```
ADJUST
  IMG-REG
        REG-XA
        REG-XB
        REG-Y
FUNC
  ATTRACT
        ATT-T-A
        ATT-T-B
        TR-DELAY
```

l. After Replacing the BD Unit (beam detector assembly)

Make adjustments as follows whenever you have replaced the BD unit:

1) Set the meter to the VAC RANGE.
2) Connect the + probe of the meter to the check pin TP301 on the BD PCB and the – probe to the check pin GND.
3) Activate the laser in service mode ('FUNC'→'LASER'→'POWER').
4) Loosen the screw used to fix the BD unit in place, and fix it in position where the tester output reading is maximum.

2. Adjusting the Laser Power

You must adjust the laser power whenever you have replaced the laser scanner, laser unit, or laser driver PCB.

If you have adjusted the laser power or laser, you must always replace the Bk developer, adjust the Bk toner density VR, and execute Bk toner density initial settings read-in.

a. Tools

- Laser power checker (FY9-4013)
- Digital multimeter (CK-0436)

Caution:
The output of the laser power checker tends to change over time; be sure to have it calibrated using the special laser power checker calibrator at one-year intervals.

1) Turn off the power switch.
2) Open the left door, remove the four screws ①, and remove the left inside cover.

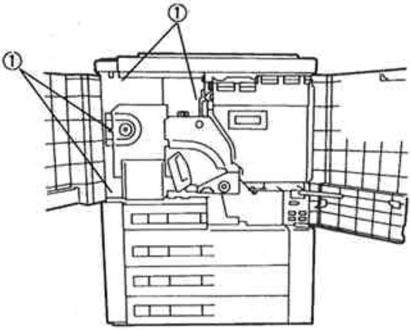


Figure 3-1106

3) Loosen the two screw ②, and remove the laser power checker slot cover③.

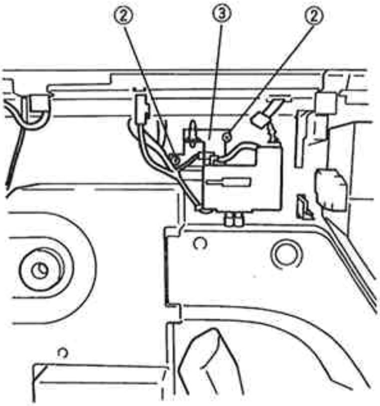


Figure 3-1107

4) Set the laser power checker switch to '2'.
5) While keeping the light-receiving face of the laser power checker ④ on the right, insert the laser power checker into the slot ⑤.

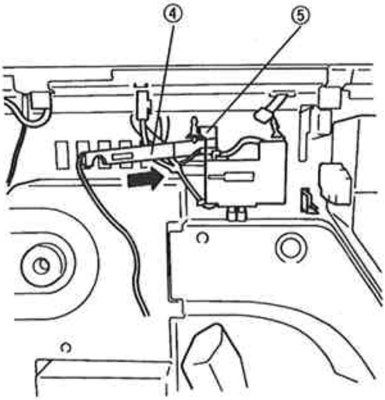


Figure 3-1108

6) Insert the lead wire of the laser power checker into the digital multimeter, and set the range to 200 mVDC.
7) Insert the door switch actuator into the front door switch, and turn on the power.
8) Activate service mode, and select 'POWER' of 'LASER' under 'FUNC' in service mode.
9) Check that the reading is as indicated in the label on the laser unit. If not, turn VR956 for rough adjustment, and turn VR955 for fine adjustment until the reading matches the value indicated in the label.

Making Adjustments

1) Open the front left door.
2) Remove the two hopper stoppers, and open the hopper.
3) Adjust VR956 and VR955 by inserting a screwdriver through the hole in the front side plate.

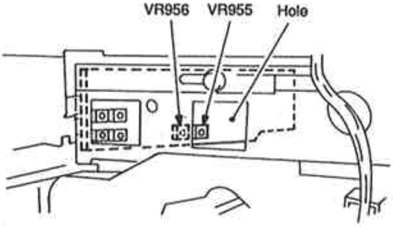


Figure 3-1109

Caution:

- Check the upper limit recorded in the label attached to the laser unit in advance.

Label for Pmax

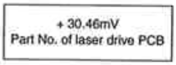

+30.46mV
Part No. of laser drive PCB

Figure 3-1110

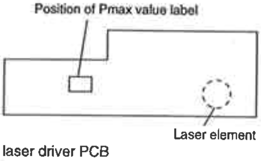


Figure 3-1111

- Turn VR956 slowly while checking the output of the laser power checker; avoid increasing the laser power excessively.
- A counterclockwise turn of VR956 lower the laser output.
- Make sure that the upper limit recorded in the label is not exceeded; otherwise, the laser diode may become damaged.

10) Press the C/▼key.
11) Adjust the laser.

3. Adjusting the Laser

Caution:
Be sure to adjust the laser power before adjusting the laser.

1) Select 'TX-V00' of 'LASER' under 'FUNC' in service mode.
2) Turn VR952 clockwise, and make notes of the value at which it stops changing (offset value).
3) Turn VR952 until the following value is obtained true:
   offset value + 0.1 mV
   (tolerance $\pm{}^{0}_{0.1}$mV)
4) Likewise, make adjustments for 'TX-Vff, PH-V00, PH-VFF' in the order given and with reference to the following table; to stop the laser output, press the C/▼ key.

	VR	Standards (mV)
TX-V_{00}	952	offset value +0.1 $\pm^{0}_{0.1}$
TX-V_{FF}	951	0.8 x Pmax + 0.4 ±0.3
PH-V_{00}	954	offset value + 0.1 $\pm^{0}_{0.1}$
PH-V_{FF}	953	0.8 x Pmax + 0.4 ±0.3

Table 3-1102

5) Press the Reset key to deactivate service mode; then, turn off the power switch.
6) Remove the laser power checker, and fix the slot cover in place.
7) Install the IP cooling fan duct and the left inside cover.

4. Checking the Environment Measuring PCB

Use the environment measuring PCB checking tool (TKN-0457) and environment sensor calibrating tool (TKN-0456) to check the environment measuring PCB and environment sensor.

① Checking the Environment Measuring PCB

1) Turn off the power switch.
2) Open the hopper assembly.
3) Remove the environment sensor from the environment measuring PCB; in its place, insert the environment measuring PCB checking tool (TKN-0457).
4) Insert the door switch actuator, and turn off the power switch.
5) Set the meter to the 30VDC range.
   Check that the voltage between J1-1 (+) and J1-2 (–) of the environment measuring PCB is 24 ±2.4 V.
   If it is not 24±2.4 V, check the DC power supply PCB (DCP1).
6) Activate service mode, and select 'DISPLAY'.
7) Check the temperature/humidity on the ANALOG screen.
   BODY °C .... 25 ±5
   BODY % .... 40 ±10
8) Check that the reading is within the specification.
   If it is not within the specification, go to step 9).
   If it is within the specification, go to step 14).
9) Press the Reset key, and turn off the power switch.
10) Disconnect connector J1 from the environment PCB.
11) Turn on the power switch, and activate service mode; then, select 'DISPAY'.
12) Check the temperature/humidity on the ANALOG screen.
    BODY °C .... 25 ±5
    BODY % .... 36 ±10
13) Check that the reading is within the specification.

Reference:
If it is outside the specification, suspect a fault in the DC controller PCB.

14) Press the Reset key.
15) Turn off the power switch.
16) Connect the connector J1 to the environment measuring PCB.
17) Remove the environment measuring PCB from the environment measuring PCB; in its place, insert the environment sensor.
18) Replace all covers.

② Checking the Environment Sensor

1) Check the environment measuring PCB.
2) Turn on the power, and leave the copier on for 5 min.
3) Activate service mode, and select 'DISPLAY'.
4) Check and take notes of the temperature/humidity on the ANALOG screen (data A).
   BODY °C .... data A1
   BODY % .... data A2
5) Press the Reset key, and turn off the power switch.
6) Remove the environment sensor from the environment measuring PCB; in its place, insert the environment sensor calibrator tool (TKN-0456).
7) Turn on the power switch, and leave the copier for 5 min.
8) Activate service mode, and select 'DISPLAY'.
9) Check and take notes of the temperature/humidity on the ANALOG screen (data B).
   BODY °C .... data B1
   BODY % .... data B2
10) Compare data A and data B.

- difference between data A1 and data B1 is 0 ±5
- difference between data A2 and data B2 is 0 ±20

If the difference between data A and data B is outside the specification, replace the environment sensor.

11) Press the Reset key, and turn off the power switch.
12) Remove the environment sensor calibrator from the environment measuring PCB; in its place, insert the environment sensor.
13) Replace all covers.

Caution:
The environment sensor calibrating tool (TKN-0456) is adjusted at the factory with high precision; keep it in an air-tight container with a drying agent.

5. Storing the Cassette/Multifeeder Paper Width Basic Settings (FUNC)

Execute cassette/multifeeder paper width basic settings registration under the following conditions:

- After replacing the copier's paper width detecting VR (including the multifeeder).
- After adjusting the registration (front, rear) for the cassette.

For the cassette 1, you must register for B5 and A4; for each of the cassettes 2 through 4, you must register for STMTR and A4R; for the multifeeder, you must register for A6R, A4R, and A4.

a. Cassettes 1 through 4

1) Slide out the cassette for which you want to register the basic settings, and set the paper width guide plate inside the cassette to A4 (cassette 1) or A4R (cassettes 2 through 4).
2) Set the cassette in the copier.
3) Check that the control panel displays the basic settings on the CST-AD screen for 'FUNC' of service mode.
4) Select the size of the cassette for which you want to register the basic settings.

C1-A4
C2-A4R
C3-A4R
C4-A4R

5) Check that basic setting 1 has been registered.
6) Slide out the cassette for which you want to register the basic settings, and set the paper width guide plate to B5 (cassette 1) or STMTR (cassettes 2 through 7).
8) Set the cassette in the copier.
9) Check that the control panel displays the basic setting on the CST-AD screen under 'FUNC' of service mode.
10) Select the size of the cassette for which you want to register the basic settings.

C1-B5
C2-STMTR
C3-STMTR
C4STMTR

11) Check that basic setting 2 has been registered.

b. Multifeeder

1) Set the multifeeder manual feed guide to A6R (105 mm).

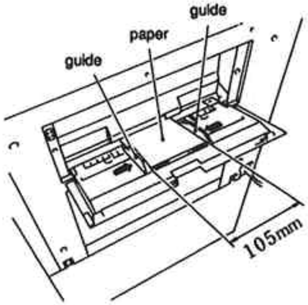


Figure 3-1112

2) Check that the control panel displays the basic settings on the CST-AD screen under 'FUNC' of service mode.
3) Select the size for which you want to register the basic setting.

MF-A6R

4) Check that basic setting 1 has been registered.
5) Set the multifeeder manual feed guide plate to A4R (210 mm).
6) Check that the control panel displays the basic settings on the CST-AD screen under 'FUNC' of service mode.
7) Select the size for which you want to register

the basic settings.
MF-A4R

8) Check that basic setting 2 has been registered.
9) Set the multifeeder manual guide plate to A4 (297 mm).
10) Check that the control panel displays the basic settings on the CST-AD screen under 'FUNC' of service mode.
11) Select the size for which you want to register the basic settings.
MF-A4
12) Check that basic setting 3 has been registered.

Caution:
Whenever you have registered basic settings, be sure to record them on the Service Label.
Further, if you have replaced the DC controller PCB, you must store the settings recorded on the Service Label using 'DC-CON' under 'FUNC' of service mode.

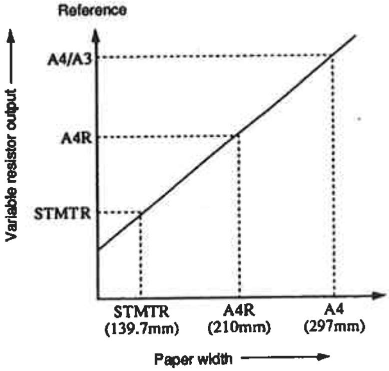


Figure 3-1113

• NOTE

I. Test Print

The copier has 12 types of test print patterns, each one of which may be used to identify a specific image problem. If a problem in copies made in normal mode is not noted in a test print, you may suspect a problem in the scanning system, CCD, analog processor, or image processor.

1. Selecting a Test Print Pattern

1) Set the copy count, copy paper size, and color mode*.
   * The color mode is effective when PGTYPE=3, 4, 5, 6.
2) Activate service mode (* → 2, 8→ *)
3) Press 'TEST' under 'OPTION'.
4) Select 'PGTYPE'.
5) Enter a PGTYPE number.
6) Press the Copy Start key.

Caution:
You must return the setting of 'PGTYPE' to '0' after finishing checks using test prints.

- **Setting the Test Print Density (DENS-Y, -M, -C, and -Bk)**

This is effective when generating test prints when 'PGTYPE=5 or 6'.

1) Set the density by pressing 'DENS-Y, -M, -C, or -K'.

PGTYPE	Description
0	Image from CCD (normal copy)
1	For R&D
2	256 colors
3	256 gradations
4	16 gradations
5	Full-face halftone
6	Grid
7 – 9	For R&D
10	MCYBk horizontal stripe (laser FF activation)
11	For R&D
12	YMCBk 64 gradations
13	BGR64 gradations
14	Full color 16 gradations (YMCBk)
15	Full color light area 16 gradation (YMCBk)
16	MCYBk horizontal stripe (laser A0 activation)

Table 3-1103

2. Horizontal Test Print (PGTYPE= 10, 16)

With the horizontal test print, you can check the density of dark areas for each color, balance among colors, and white lines in relation to development.

a. Dark Area Density of Each Color and Balance among Colors

The density must not be appreciably low.

If the density is too low for a mono color, suspect the developing assembly used for light color.

If the density is too low for all colors, suspect the laser system.

b. White Lines (development)

If, for example, white lines are noted within the cyan areas of the copy image, suspect the developing assembly used for cyan.

c. Uneven Density between Left and Right

If uneven density between left and right occurs in the same way for all colors, suspect that the developing assembly spacer or butting block is soiled or the height of the primary corona wire is not correct.

d. Image Position (left/right)

If the position of the cassette holder or 'ADJ-X, Y' setting is not correct, copy paper and images cannot be aligned correctly, eliminating the non-image width.

This will lead to stray toner, soiling the inside of the machine.

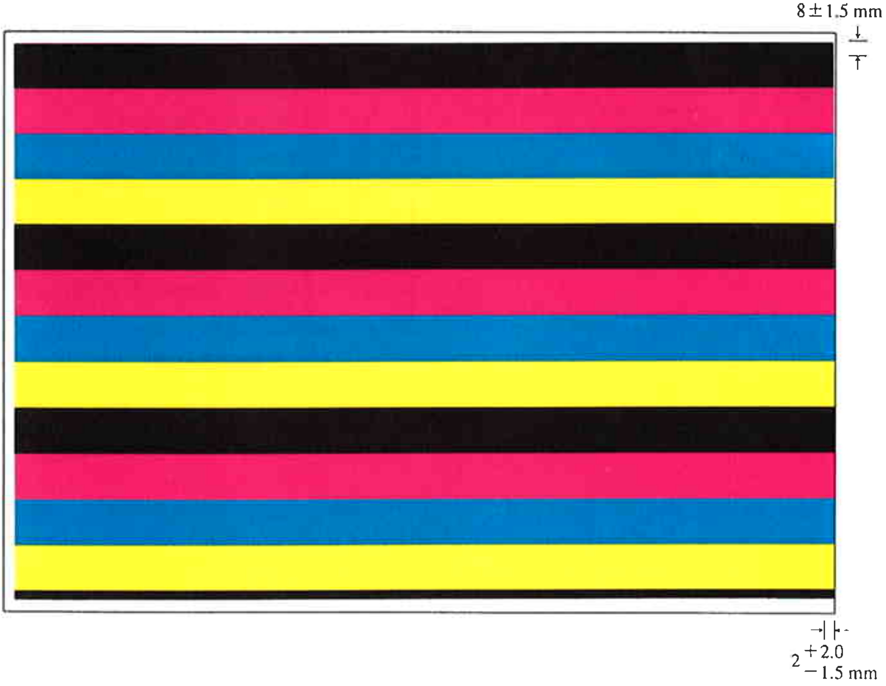


Figure 3-1114

3. 256-Color Test Print (PGTYPE=2)

With the 256-color test print, you can mainly check the hues.

The 256-color test print represents 256 colors in 16x16 frames running from the leading edge of the copy paper.

a. Tinges of 256 Colors

The tinges shown in Figure 3-1115 must be reproduced.

If the tinges are different, suspect deterioration of the developer, deterioration of the photosensitive drum, or mixing of developers.

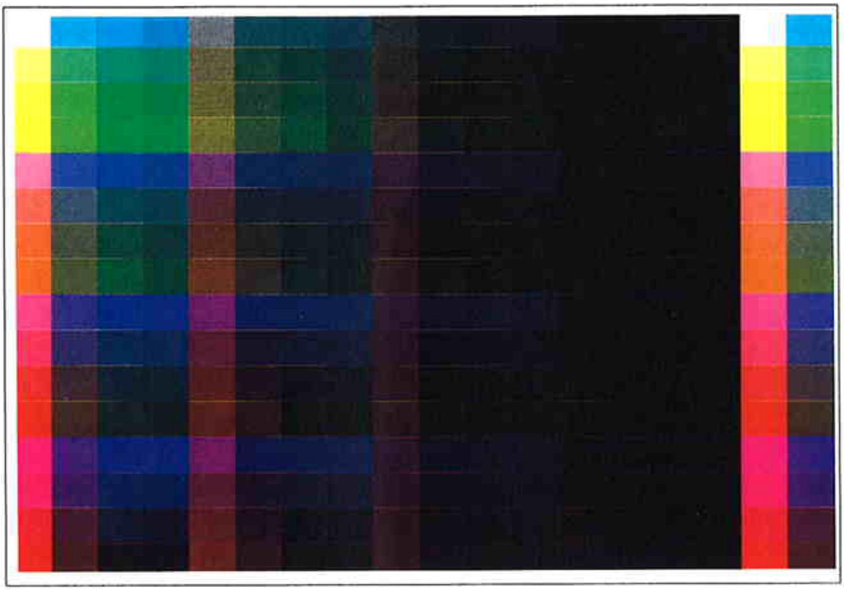


Figure 3-1115

4. 256-Gradation Test Print (PGTYPE=3)

You may specify three colors and generate a test print to check the gray balance for all densities between density 0 and 255.

a. Gradation

You can check the gradation of all densities between 0 and 255.

b. Color Balance (between colors; 3-color copying)

You can check the gray balance of all densities between 0 and 255 by specifying 3-color printing when generating a test print.

Caution:
You can specify mono or 3-color mode in user mode.

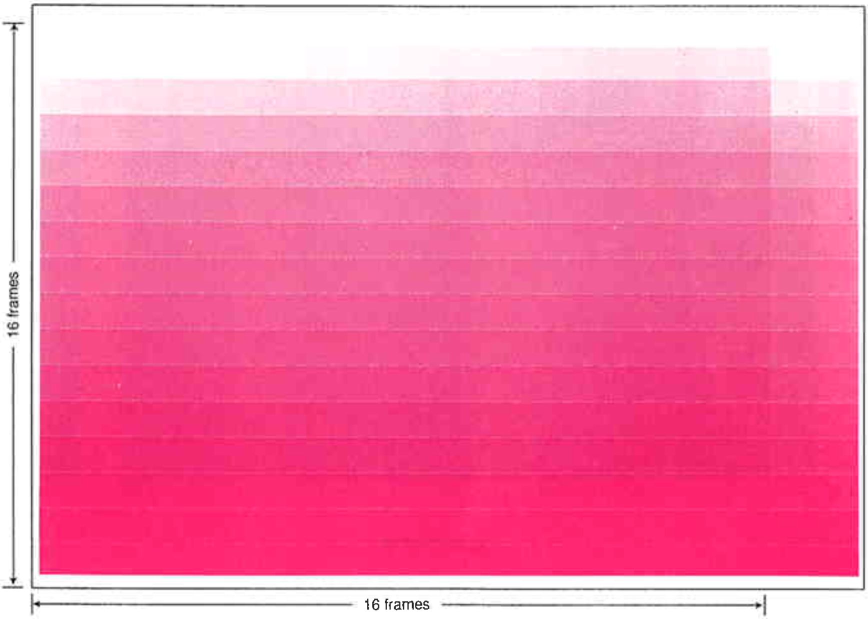


Figure 3-1116

5. 16-Gradation Test Print (PGTYPE=4)

With the 16-gradation test print, you may mainly check the gradation, fogging, white lines, uneven density between left and right, and balance among colors.

a. Gradation

If the density in 16 gradations is not as shown in Figure 3-1117, suspect the laser system.

b. Fogging

If fogging is noted only in the white area shown in Figure 3-1117, suspect the developing system, photosensitive drum, or laser adjustment.

c. White Lines

If white lines are noted on the image, suspect the developing system.

d. Uneven Density Between Left and Right

If uneven density is noted between left and right, suspect chipping of the developing spacer, soiling of the butting block, or the height of the primary corona wire.

e. Balance Among Colors (3-color copies)

You can check the gray balance for each density by specifying 3-color mode and generating a test print.

Caution:
You can specify mono or 3-color mode in user mode.

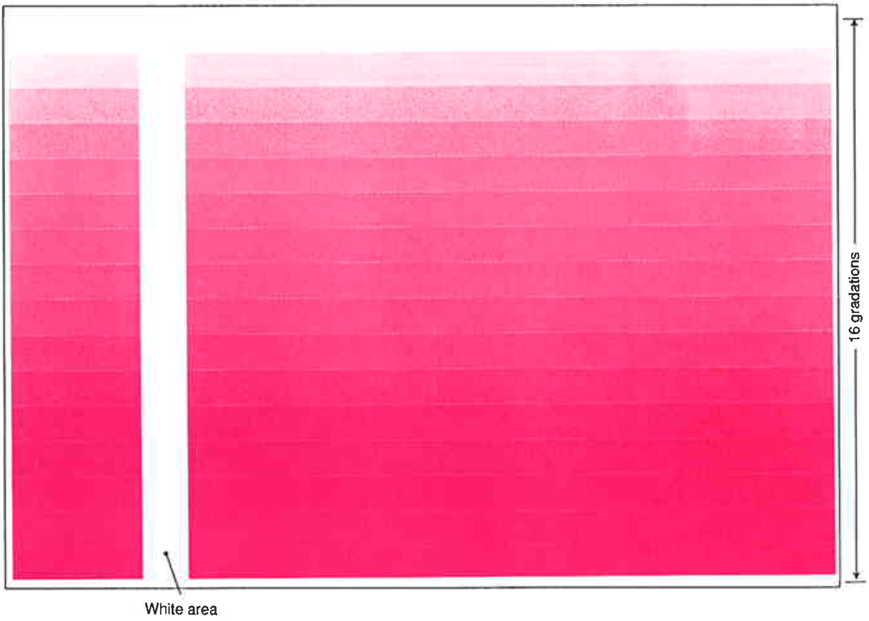


Figure 3-1117

6. Halftone Test Print (PGTYPE=5)

With the halftone test print, you can mainly check transfer failure, black lines, white lines, and uneven pitch.

a. Transfer Failure

If transfer failure occurs, suspect the transfer drum sheet or static eliminator.

b. Black Lines

If black lines occur, suspect scratches in the photosensitive drum or soiling of the primary corona wire.

c. White Lines

If white lines occur at the same location for all colors, suspect the transfer drum sheet.

If the problem occurs at different locations or the problem is limited to a single color, suspect the developing assembly.

d. Uneven Pitch

If uneven pitch occurs, suspect the following:

• scanner*	0.5 mm pitch (approx.)
• developing cylinder	42 mm (approx.)
• registration roller drive gear	1.6 mm (approx.)

*Does not occur on a test print.

Caution:
You can specify mono or 3-color mode in user mode.

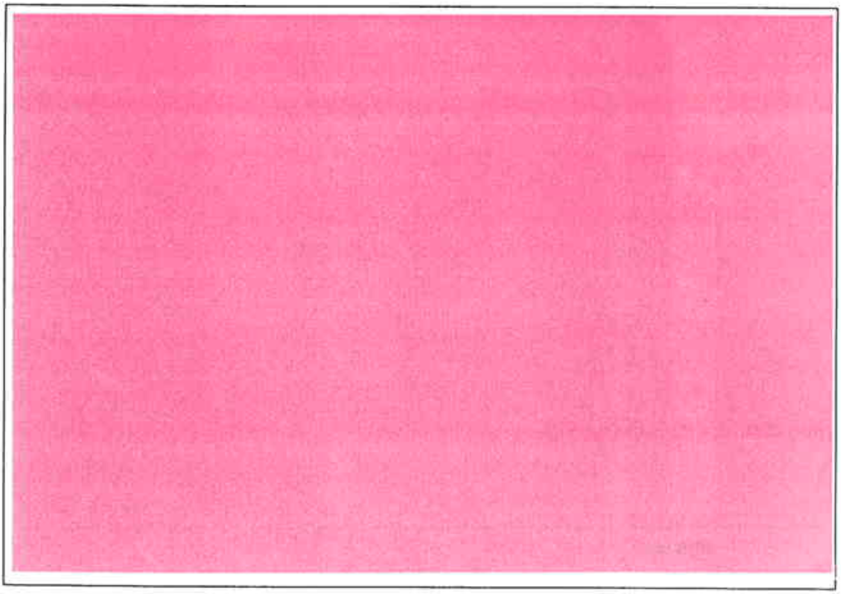


Figure 3-1118

7. Grid Test Print (PGTYPE=6)

With the grid test print, you can mainly check color displacement, angle, and linearity.

a. Color Displacement

If color displacement occurs, suspect the transfer drum sheet.

Even if color displacement occurs on a test print, the black text processing mechanism at work in normal copying mode may correct it so that the problem may be absent on copies. The problem may be ignored if it does not appear on normal copies; keep in mind that this test print is used to identify the point of color displacement and the color when color displacement is noted on regular copies.

b. Angle and Linearity

If a angle or linearity problem is noted, suspect displaced laser beam or BD.

Caution:
You can specify mono or 3-color mode in user mode.

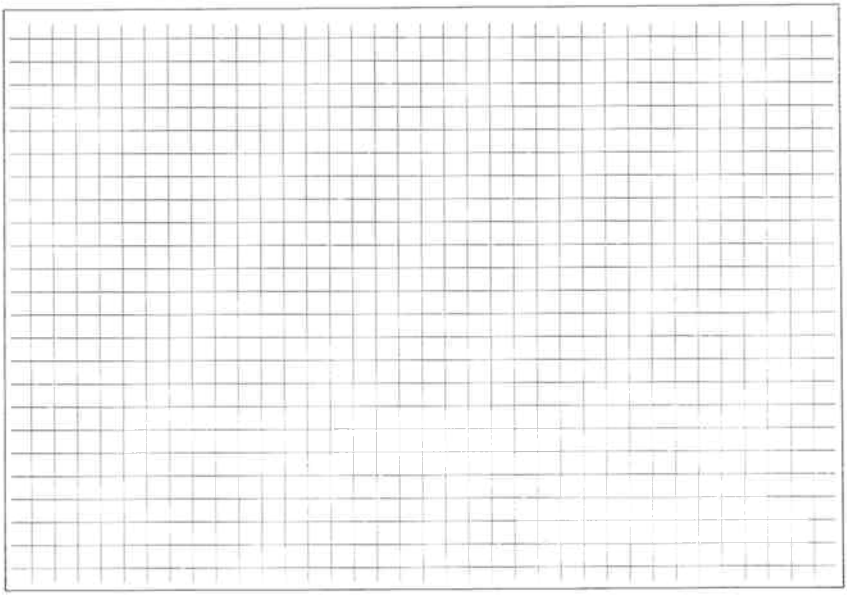


Figure 3-1119

8. YMCBk 64-Gradation Test Print (PGTYPE=12)

With the YMCBk 64-gradation test print, you can check each of the colors (YMCBk) at a glance.

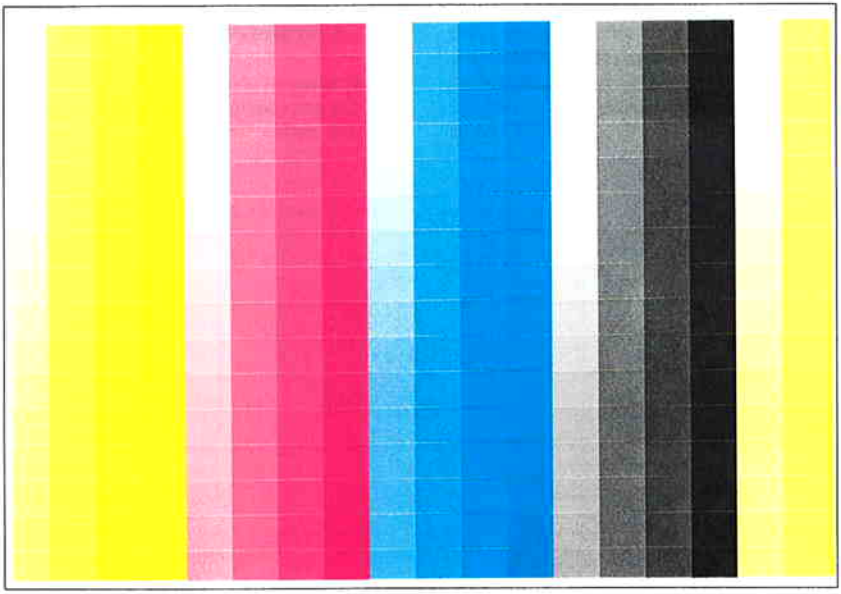


Figure 3-1120

9. BGR 64-Gradation Test Print (PGTYPE=13)

With the BGR 64-gradation test print, you can mainly check the gray balance and the gradation of each of the colors (2-color; BGR).

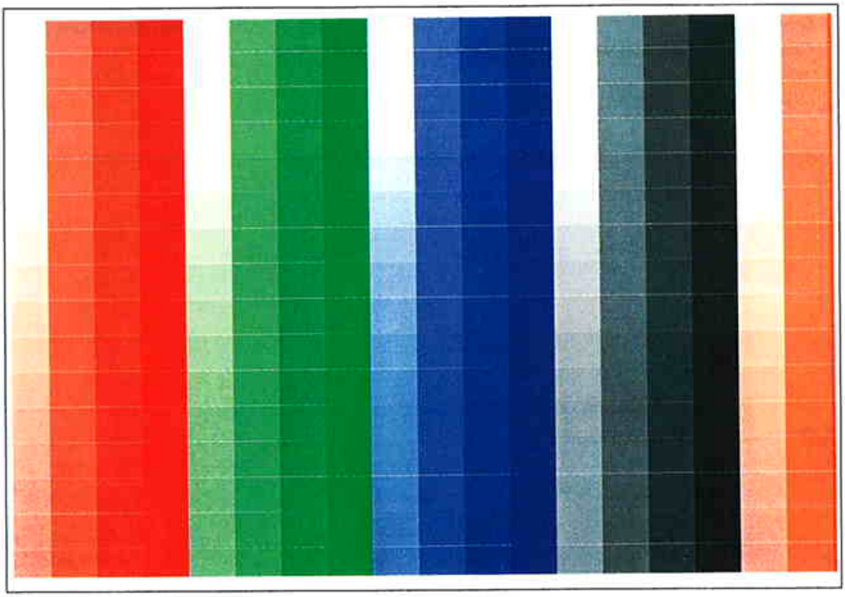


Figure 3-1121

10. Full-Color 16-Gradation (YMCBk) Test Print (PGTYPE=14)

With the full-color 16 gradation (YMCBk) test print, you can mainly check the gray balance, gradation of each mono color (YMCBk), and fogging.

a. Gray Balance

Check if each color has uniform density in the gray scale area.

Use the contrast potential for adjustments.

b. Gradation

Check the density difference and gradation of each mono color (YMCBk).

c. Fogging

If the white area has fogging, suspect the developing system, photosensitive drum, and laser adjustment.

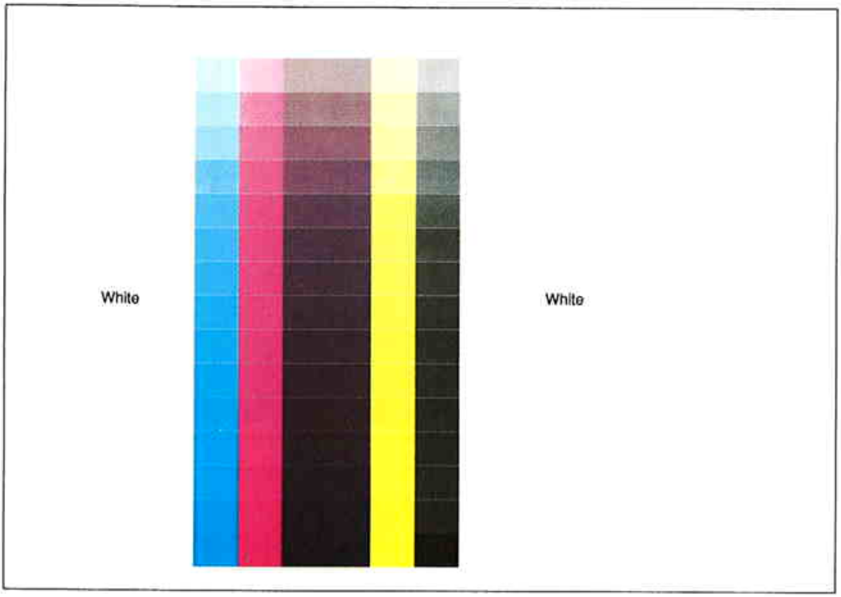


Figure 3-1122

11. Full-Color Light Area 16-Gradation (YMCBk) Test Print (PGTYPE=15)

With this test print, you can check the gray balance of the light area or the gradation of each mono color (YMCBk) with more ease than PGTYPE=14.

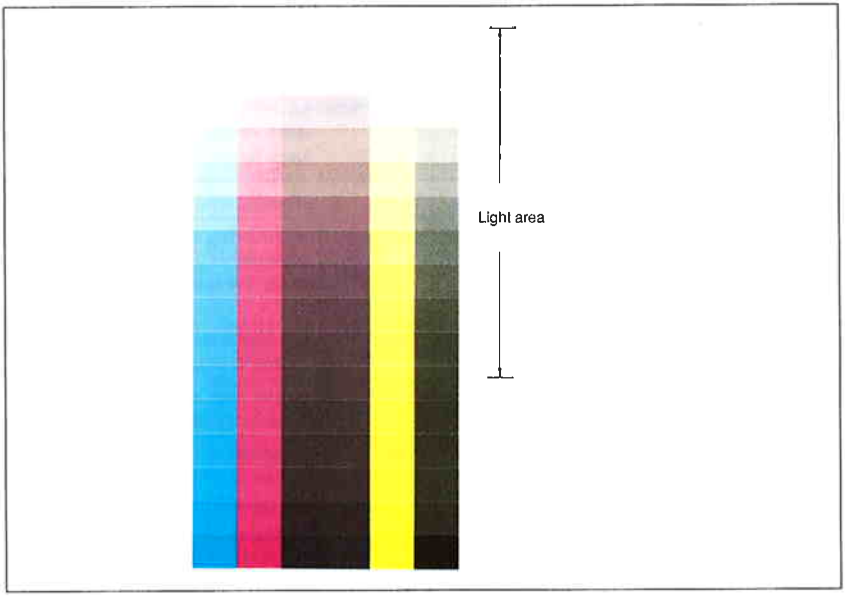


Figure 3-1123

XII. SELF DIAGNOSIS

The microprocessors on the image processor PCB and DC controller PCB are equipped with a self diagnosis mechanism that checks the condition of the copier (sensors, in particular) as needed and indicates a code on the control panel to identify the error.

Go through the table for the description of each code and when checks are made; the codes within a code provide detailed description and may be checked in 'JAM/ERROR' under 'DISPLAY' of service mode.

Code	Cause	Description	
E000	See descriptions under each classification that follows.	xx represents a heater. xx=01: upper heater xx=02: lower heater	
	Fixing thermistor (short circuit) SSR (short circuit) DC controller PCB (faulty)	xx0x	Overheating error
		xx01	The overheating detection circuit on the DC controller PCB has detected an abnormal rise in temperature (220°C or more).
		xx02	The thermistor has detected a temperature of 210°C or more.
	Fixing thermistor (poor contract, open circuit) Fixing heater (open circuit) SSR (faulty) DC controller PCB (faulty)	xx1x	The heater does not turn on normally in response to the heater ON command.
		xx2x	The temperature does not rise within a specific period of time when the temperature is controlled to 130°C or less.
		xx21	The temperature does not increase by 3°C or more in 4 min after the heater has turned on.
		xx3x	The temperature does not rise within a specific period of time when the temperature is controlled to 130°C or more.
		xx31	During temperature control (after 130°C), an increase in temperature of 1° or more is not noted in 2 min after the heater has turned on.
		xx32	During temperature control (after 130°C), an increase in temperature of 5° or more is not noted in 3 min after the heater has turned on.
		xx4x	An error has occurred, i.e., the temperature is below the specified value when it is controlled during standby.
		xx5x	An error has occurred, i.e., the temperature is below the specified value when it is controlled during printing operation.

Table 3-1201

Code	Cause	Description	
E004	SSR (short circuit)	0001	The SSR is on even though the microprocessor on the DC controller PCB has turned off the SSR drive signal for the fixing heater.
		0002	The SSR is on even though the microprocessor on the DC controller PCB has turned off the SSR drive signal for the cassette heater/drum heater.
E005	• Cleaning belt (inside the fixing assembly; taken up) • Cleaning belt length sensor (PS10; faulty) • DC controller PCB (faulty)	As many as 2000 copies have been made since a warning has been issued in response to detection of the cleaning belt lever by the cleaning belt length sensor.	
E006	• Fixing assembly drawer connector (faulty) • DC controller PCB (faulty)	The connect signal ‘CONNECT’ of the fixing drawer connector has gone ‘0’.	
E008	• Oil pump drive solenoid (SL12; faulty) • Fixing oil level sensor (PS9; faulty) • Oil supply path (faulty) • Fixing oil (inadequate)	The presence of oil is not detected when 100copies have been made after the fixing oil level sensor detected the absence of oil and indecated a massage.	
E010	• Main drive system (overload) • Main motor (M4; faulty) • DC controller PCB (faulty)	The main motor ready signal (M4RDY*) is ‘1’ for 0.5 sec or more while the main motor is rotating.	
E012	• Drum home position sensor (PS38; faulty) • DC controller PCB (faulty)	0001	• The drum home position signal (PGHP) is not generated within 4 sec after the drum motor drive signal has been generated. • The drum home position signal (PGHP) is generated within 2 sec after the drum motor drive signal has been generated.
	• Drum drive system (overload) • Drum motor (error) • DC controller PCB (faulty)	0002	The drum motor ready signal (M2RDY) is ‘1’ for 0.5 sec or more while the drum motor is rotating.

Code	Cause	Description	
E013	• Waste toner feeding screw (error) • DC controller PCB (faulty)	The detecting switch (MS4) is pressed after the waste toner feeding screw has become unable to rotate.	
E014	• Fixing motor (M5; error) • DC controller PCB (faulty)	The clock pulses of the fixing motor cannot be detected.	
E015	• Pick-up motor (M6; error) • DC controller PCB (faulty)	The clock pulses of the pick-up motor cannot be detected.	
E016	• Photosensitive drum cleaner reciprocating motor (M9; faulty) • DC controller PCB (faulty)	The photosensitive drum cleaner reciprocating motor drive circuit on the DC controller PCB has detected an overcurrent for 0.1 sec or more.	
E020	See descriptions under each classification that follows.	Toner Density Error xx represents the color of the developing assembly. xx=00: MCYBk in common xx=01: M xx=02: C xx=03: Y xx=04: Bk In the descriptions, the notation SGNL refers to the toner density signal and REF, reference signal.	
	• Toner density sensor (faulty) • Stirring (developer, inside the developing assembly) The following applies to Bk only: • Stray light (to the sensor assembly; cover absent, front door open) • Photosensitive drum (deterioration)	xx00	The connector has disengaged. The value of 'REF' is '50' or lower
		xx10	At Time of Setting Initial Data (e.g., installation) The variation of M-SGNL, C-SGNL, and Y-SGNL is '41' or more or the variation of K-SGNL is '102' or more when sampling the density data 10 times.
		xx11	At Time of Setting Initial Data (e.g., installation) The variation of M-REF, C-REF, any-REF is '41' or more or the variation of K-SGNL is '102' or more when sampling the density data 10 times.

Code	Cause	Description	
E020	• Toner density sensor (faulty) • Stirring (developer, inside the developing assembly) The following applies to Bk only: • Stray light (to the sensor assembly; cover absent, front door open) • Photosensitive drum (deterioration)	xx20	At Time of Setting Initial Data (e.g., installation) The variation of M-SGNL, C-SGNL, and Y-SGNL is '41' or more when sampling the density data 100 times or the variation of K-SGNL is '102' or more when sampling the density data 10 times.
		xx21	At Time of Setting Initial Data (e.g., installation) The variation of M-REF, C-REF, and Y-REF is '41' or more when sampling the density data 100 times or the variation of K-REF is '102' or more when sampling the density data 340 times.
		xx30	At Time of Setting Initial Data (e.g., installation) The value of M-SGNL, C-SGNL, and Y-SGNL that has been averaged after sampling is '777' or less or the value of K-SGNL is '163' or less.
		xx31	At Time of Setting Initial Data (e.g., installation) The value of M-REF, C-REF, and Y-REF that has been averaged after sampling is '144' or less or the value of K-REF is '777' or less.
		xx32	At Time of Setting Initial Data (e.g., installation) The value of SGAIN-M/-C/-Y/-K is '0'.
		0433	At Time of Setting Initial Data (e.g., installation) The value of REFG-K is '0'.
		xx40	At Time of Setting Initial Data (e.g., installation) The value of M-SGNL, C-SGNL, and Y-SGNL that has been averaged after sampling is '859' or more or the value of K-SGNL is '410' or more.

Code	Cause	Description	
E020	• Toner density sensor (faulty) • Stirring (developer, inside the developing assembly) The following applies to Bk only: • Stray light (to the sensor assembly; cover absent, front door open) • Photosensitive drum (deterioration)	xx41	The value of M-REF, C-REF, and Y-REF that has been averaged after sampling is '920' or more or the value of K-REF is '859' or more.
		xx42	At Time of Setting Initial Data (e.g., installation) The value of SGAIN-M/-C/-Y/-K is '255'.
		0443	At Time of Setting Initial Data (e.g., Installation) The value of REFG-K is '255'.
	• Toner density sensor (faulty) • Stirring (developer, inside the developing assembly) The following applies to Bk only: • Stray light (to the sensor assembly; cover absent, front door open)	xx50	At Time of Setting Initial Data (e.g., installation) The gain cannot be set. (No target value exists for 'SGNL' between 'GAIN: 20H' and 'GAIN: E0'.)
		0451	At Time of Setting Initial Data (e.g., installation) The gain cannot be set. (No target value exists for 'REF' between 'GAIN: 20H' and 'GAIN: E0'.)
	• Black toner density sensor window (dirt, scratches), Protection sheet (dirt) • Photosensitive drum (dirt, cleaning failure)	0460	At Time of Multiple Initial Rotation (e.g., at power-on) The window soiling correction value is 75% or below the specified value.
		0470	At Time of Multiple Initial Rotation (e.g., at power-on) The window soiling correction value is 125% or more of the specified value.
	DC controller PCB (backup data error; be sure to clear the RAM, and enter the setting recorded on the Service Label) Initial settings (not made)	xx80	During a copying sequence, the value of M-SGNL, C-SGNL, or Y-SGNL is '777' or less or the value of K-SGNL is '163' or less because of an error in the memory backup data.
		xx81	During a copying sequence, the value of M-RFF, C-REF, or Y-REF (initial settings) is '144' or less or the value of K-REF is '777' or less because of an error in the memory backup data.

Code	Cause	Description	
E020	DC controller PCB (backup data error; be sure to clear the RAM, and enter the setting recorded on the Service Label) Initial settings (not made)	xx82	During a copying sequence, the value of SGAIN-M/-C/-Y/-K is '0' because of an error in the memory backup data.
		0483	During a copying sequence, the value of REFG-K is '0' because of an error in the memory backup data.
		xx90	During a copying sequence, the value of M-SGNL, C-SGNL, or Y-SGNL (initial settings) is '859' or more or the value of K-SGNL is '470' because of an error in the memory backup data.
		xx91	During a copying sequence, the value of M-REF, C-REF, or Y-REF (initial settings) is '920' or more or the value of K-REF is '859' or more because of an error in the memory backup data.
		xx92	The value of SGAIN-M/-C/-Y/-K is '255' because of an error in the memory back-up data.
		0493	During a copying sequence, the value of REFG-K is '255' because of an error in the memory backup data.
	• Developer (deterioration) • Developing cylinder (fails to rotate) • Developing assembly (fails to engage) • Toner density sensor (faulty) • developer (inside the developing assembly; stirring fault) • Toner level sensor (faulty) The following applies to Bk only: • Stray light (to the sensor assembly; cover absent, front door open) • Photosensitive drum (deterioration)	xxA0	During a copying sequence, the variation in the values of M-SGNL, C-SGNL, Y-SGNL, and K-SGNL is '102' or more when sampling the data 10 times.
		xxA1	During a copying sequence, the variation in the values of M-REF, C-REF, Y-REF, and K-REF is '102' or more when sampling the data 10 times.
		xxB0	During a copying sequence, the average of the values of M-SGNL, C-SGNL, Y-SGNL is '306' or less or the value of K-SGNL is '102' or less after sampling the data.
		xxB1	During a copying sequence, the value of REF dropped from the initial setting by 30% or more.

Code	Cause	Description	
E020	• Developer (deterioration) • Developing cylinder (fails to rotate) • Developing assembly (fails to engage) • Toner density sensor (faulty) • developer (inside the developing assembly; stirring fault) • Toner level sensor (faulty) The following applies to Bk only: • Stray light (to the sensor assembly; cover absent, front door open) • Photosensitive drum (deterioration)	xxC0	During a copying sequence, the average of the values of SGNL-M, SGNL-C, SGNL-Y is '1013' or more or the value of SGNL-K is '550' or more when sampling the data.
		xxC1	During a copying sequence, the value of REF has risen from the initial setting by 30% or more.
		xxD0	During a copying sequence, the value of SGNL remained -3% or more than the initial setting while 20 copies (Large size) were made continuously.
		xxE0	During a copying sequence, the value of SGNL remained +3% or more than the initial setting while 20 copies (Large size) are made continuously.
		00F0	The hopper motor drive circuit has detected an overcurrent for 0.7 sec or more.
E030	• Counter (open circuit) • DC controller PCB	Make a check immediately before the counter turns on and off; normal if the counter drive signal is '0' when the counter turns on or if the counter drive signal is '1' when the counter turns off.	
E032	• Copy Data Controller-related error	The counter or the like of the Copy Data Controller-A1 does not operate.	
E050	Duplexing Unit • Connector (disconnected) • Sensor (faulty) • Motor (faulty) / Belt (torn) • DC controller PCB (faulty)	A specific fault is detected at the start of two-sided copying.	

Code	Cause	Description	
E061	• Potential measuring unit (faulty) • Primary corona assembly (faulty) • HVDC (faulty) • DC controller PCB (faulty) • Laser unit (faulty) • Laser shutter (faulty) • Pre-exposure lamp (faulty) • Environment sensor (faulty) • Photosensitive drum (faulty) • Photosensitive drum (faulty grounding)	Potential Control Fault Higher 2 Digits xx=00: MCYBk in common xx=01: M xx=02: C xx=03: Y xx=04: Bk	
		xx00	The computed value of V00 for the 1st rotation is below the lower limit (100V).
		xx01	The computed value of V00 for the 1st rotation is above the upper limit (900V).
		xx02	The computed value of VFF for the 1st rotation is below the lower limit (10V).
		xx03	The computed value of VFF for the 1st rotation is above the upper limit (800V).
		xx04	The computed value of the grid bias for the 1st rotation is below the lower limit (200V).
		xx05	The computed value of the grid bias for the 1st rotation is above the upper limit (900V).
		xx06	The computed value of the developing bias for the 1st rotation is below the lower limit (200 v).
		xx07	The computed value of the developing bias for the 1st rotation is above the upper limit (700V).
		xx08	The computed value of the V00 for the 2nd rotation is below the lower limit (100V).

Code	Cause	Description	
E061	• Potential measuring unit (faulty) • Primary corona assembly (faulty) • HVDC (faulty) • DC controller PCB (faulty) • Laser unit (faulty) • Laser shutter (faulty) • Pre-exposure lamp (faulty) • Environment sensor (faulty) • Photosensitive drum (faulty) • Photosensitive drum (faulty grounding)	xx09	The computed value of V00 for the 2nd rotation is above the upper limit (900V).
		xx0A	The computed value of VFF for the 2nd rotation is below the lower limit (10V).
		xx0B	The computed value of VFF for the 2nd rotation is above the upper value (800V).
		xx0C	The computed value of the grid bias for the 2nd rotation is below the lower limit (200V).
		xx0D	The computed value of the grid bias for the 2nd rotation is above the upper limit (900V).
		xx0E	The computed value of the developing bias for the 2nd rotation is below the lower limit (200V).
		xx0F	The computed value of the developing bias for the 2nd rotation is above the upper limit (700V).
		001x: Inadequate primary corona assembly output	
		0010	The photosensitive drum surface potential V is below the lower limit (20V) for the 1st rotation when laser output voltage=V00, grid bias=300V, –500V, and =700V.
		0011	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (20V) when laser output voltage=V00 and grid bias=300V.
		0012	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=500V.

Code	Cause	Description	
E061	• Potential measuring unit (faulty) • Primary corona assembly (faulty) • HVDC (faulty) • DC controller PCB (faulty) • Laser unit (faulty) • Laser shutter (faulty) • Pre-exposure lamp (faulty) • Environment sensor (faulty) • Photosensitive drum (faulty) • Photosensitive drum (faulty grounding)	0013	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V.
		0018	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V.
		0019	The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=300V.
		001A	The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=500V.
		001B	When the photosensitive drum surface potential V for the 2nd rotation is blow the lower limit (20V) when the laser output voltage=V00 and the grid bias=700V.
		002x: Grid bias output fault (primary corona assembly)	
		0020	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias is =300V, =500V, and =700V.

Code	Cause	Description	
E061	• Potential measuring unit (faulty) • Primary corona assembly (faulty) • HVDC (faulty) • DC controller PCB (faulty) • Laser unit (faulty) • Laser shutter (faulty) • Pre-exposure lamp (faulty) • Environment sensor (faulty) • Photosensitive drum (faulty) • Photosensitive drum (faulty grounding)	0021	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V100 and the grid bias =300V.
		0022	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=100 and the grid bias=500V.
		0023	The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=700V.
		0028	The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V.
		0029	The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=300V.
		002A	The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=500V.
		002B	The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=700V.
		003x: primary corona assembly grid wire broken	

Code	Cause	Description	
E061	• Potential measuring unit (faulty) • Primary corona assembly (faulty) • HVDC (faulty) • DC controller PCB (faulty) • Laser unit (faulty) • Laser shutter (faulty) • Pre-exposure lamp (faulty) • Environment sensor (faulty) • Photosensitive drum (faulty) • Photosensitive drum (faulty grounding)	0030	The photosensitive drum surface potential V for the 1st rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V.
		0031	The photosensitive drum surface potential V for the 1st rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias =300V.
		0032	The photosensitive drum surface potential V for the 1st rotation is above the upper value (900 V) when the laser output voltage=V00 and the grid bias=500V.
		0033	The photosensitive drum surface potential V for the 1st rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=700V.
		0038	The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V.
		0039	The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=300V.
		003A	The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=500V.
		003B	The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=700V.

Code	Cause	Description	
E061	• Potential measuring unit (faulty) • Primary corona assembly (faulty) • HVDC (faulty) • DC controller PCB (faulty) • Laser unit (faulty) • Laser shutter (faulty) • Pre-exposure lamp (faulty) • Environment sensor (faulty) • Photosensitive drum (faulty) • Photosensitive drum (faulty grounding)	004x: primary corona grid wire, primary corona wire, and pre-exposure lamp faulty; connector poor contact	
		0040	For the 1st rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=300V and the photosensitive surface potential V when the grid bias=500V is below the lower limit (50V).
		0041	For the 1st rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=500V and the photosensitive surface potential V when the grid bias=700V is below the lower limit (50V).
		0048	For the 2nd rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=300V and the photosensitive surface potential V when the grid bias=500V is below the lower limit (50V).
		0049	For the 2nd rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=500V and the photosensitive surface potential V when the grid bias=700V is below the lower limit (50V).
		005x: inadequate laser intensity, laser unit fault, laser controller PCB faulty	
		0050	For the 1st rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=300V, =500V, and =700V with the laser output voltage=V00 and =VFF.

Code	Cause	Description	
E061	• Potential measuring unit (faulty) • Primary corona assembly (faulty) • HVDC (faulty) • DC controller PCB (faulty) • Laser unit (faulty) • Laser shutter (faulty) • Pre-exposure lamp (faulty) • Environment sensor (faulty) • Photosensitive drum (faulty) • Photosensitive drum (faulty grounding)	0051	For the 1st rotation, the difference in the photosensitive drum surface potential V is below the lower limit (50V) when the grid bias=300V with the laser output voltage=V00 and =VFF.
		0052	For the 1st rotation, the difference in the photosensitive surface potential V is below the lower limit (80V) when the grid bias=500V with the laser output voltage=V00 and =VFF.
		0053	For the 1st rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=700V with the laser output voltage=V00 and =VFF.
		0058	For the 2nd rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=300V, =500V, and =700V with the laser output voltage=V00 and =VFF.
		0059	For the 2nd rotation, the difference in the photosensitive drum surface potential V is below the lower limit (50V) when the grid bias=300V with the laser output voltage=V00 and =VFF.
		005A	For the 2nd rotation, the difference in the photosensitive surface potential V is below the lower limit (80V) when the grid bias=500V with the laser output voltage=V00 and =VFF.
		005B	For the 2nd rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=700V with the laser output voltage=V00 and =VFF.
		006x: Potential sensor faulty or potential sensor not adjusted	
		0060	The potential offset value is below the specified value (80V).
		0061	The potential offset value is above the specified value (120V)

Code	Cause	Description	
E071	• Side A sensor (PS2; faulty) • Side B sensor (PS3; faulty) • Drum motor drive system (overload) • DC controller PCB (faulty) • Transfer drum (faulty engagement)	0001	No change is detected within 10 sec after the side A image leading edge signal (ITOP-A) has engaged the transfer drum.
		0002	No change is detected within 10 sec after the side B image leading edge signal (ITOP-B) has engaged the transfer drum.
		0003	The period from the side A image leading edge signal (ITOP-A) to the side A image leading edge signal (ITOP-A) is shorter by 0.3 sec (or more) than the specified value (transfer drum rotation = 4.25 sec).
		0004	The period from the side A image leading edge signal (ITOP-A) to the side B image leading edge signal (ITOP-B) is shorter by 0.3 sec (or more) than he specified value (transfer drum 0.5 rotation = 2.125 sec).
		0005	The period from the side B image leading edge signal (ITOP-B) to the side B image leading edge signal (ITOP-B) is shorter by 0.3 sec (or more) than the specified value (transfer drum rotation = 4.25 sec).
		0006	The period from the side A image leading edge signal (ITOP-A) to the side B image leading edge signal (ITOP-B) is shorter by 0.3 sec (or more) than the specified value (transfer drum 0.5 rotation = 2.125 sec).
E072	• Transfer drum cleaner drive system (overload) • Transfer drum cleaner motor (M10; faulty) • DC controller PCB (faulty)	0101	The transfer drum cleaner motor drive circuit on the DC controller PCB has detected an overcurrent for 0.1 sec or more.
	• Brush drive motor (M11; faulty) • DC controller PCB (faulty)	0201	The brush drive motor drive circuit on the DC controller PCB has detected an overcurrent for 0.1 sec or more.

Code	Cause	Description	
E072	• Brush drive motor home position sensor (PS7; faulty) • Brush drive motor (M11; faulty) • DC controller PCB (faulty)	0202	• The brush drive motor home positions signal (BMTRHP) is not generated within 4 sec after the brush drive motor drive signal has been generated.
E073	• Transfer drawer connector (faulty) • DC controller PCB (faulty)	0001	The connect signal CONNECT for the transfer assembly frame drawer has gone '0'.
		0002	The connect signal CONNECT for the transfer drawer connector has gone '0'.
E100	• Laser unit (faulty) • Laser driver PCB (faulty) • Image processor PCB (faulty)	The BD signal cannot be detected for 1 sec or more when potential control is started.	
E110	• Laser scanner drive system (overload) • Laser scanner motor (M3; faulty) • DC controller PCB (faulty)	The laser scanner motor ready signal (LSMRDY*) is '1' for 0.5 sec or more while the laser scanner motor is rotating.	
E190	The laser scanner motor ready signal (LSMRDY*) is '1' for 0.1 sec or more while the laser scanner motor is rotating.	cccc	Normal
		xxxx	The RAM access to the laser controller PCB when the power switch is turned on is not normal (80xxxxH).
E208	• DC power supply (to the scanner motor driver PCB; faulty) • Wiring, connector (faulty) • Scanner motor driver PCB (faulty) • Reader controller PCB (faulty)	The communication between the scanner motor driver PCB and the reader controller PCB has remained off for 5 sec or more.	

Code	Cause	Description
E220	Scanning lamp (error) • Lamp regulator PCB (faulty)	• During standby, the scanning lamp has turned on even though the reader controller PCB has turned off the scanning lamp on signal. • During copying, the scanning lamp has turned off even though the DC controller PCB has turned on the scanning lamp on signal.
E305	• IP-MAIN PCB (faulty) • IP-PRJ PCB (faulty) • EP-eD PCB (faulty) For details, see Table 3-1104.	• RAM access failed on the IP-MAIN PCB at power-on. • RAM access on the IP-PRJ PCB or the IP-ED PCB has failed. (E305 is indicated at the start of copying in projector or area designation mode.)
E350	• Bar code (faulty, not attached) • Image processor PCB (faulty)	When the copier checked the presence/absence of a bar code label on the standard white plate before making the first copy after power-on, it has failed to detect the bar code.
E351	• IP-MAIN PCB (faulty) • IP-ECO PCB (faulty) • IP-MAIN, IP-ECO, laser driver (contact fault)	• The IP-ECOPC and the IP-MAIN PCB are not connected. • The IP-ECO PCB and the ROM are not compatible.
E352	• Bar code label (faulty or absent)	• The bar code on the standard white plate cannot be read when 'WSMP' is executed in service mode.
E620	• IP-ED PCB (faulty) • IP-MAIN PCB (faulty)	The communication between the IP-ED PCB and the IP-MAIN PCB has remained off for 5 sec or more.
E633 (TYPE1) E718 (TYPE2)	• IP-PRJ PCB (faulty) • IP-MAIN PCB (faulty) • Film projector controller PCB (faulty)	The communication between the film projector and the IP-MAIN PCB has remained off for 5 sec or more.
E634	• Film projector lamp (faulty)	See the Service Manual for the film projector.

Code	Cause	Description
E700	• DC controller PCB (faulty) • Reader controller PCB (faulty) • Power supply PCB (faulty)	The communication between the DC controller PCB and the reader controller PCB has remained for 5 sec or more.
E717	• Copy Data Controller A1-related error	The Copy Data Controller has been physically disconnected.
E800	• Power switch • DC controller PCB • DC harness	A break in the auto shutoff signal has been detected.
E804	• Power supply unit cooling fan (FM8) Error	The power unit cooling fan (FM8) has stopped to rotate.

E305 in Detail

Detail code	Description	Detail code	Description
0001	BD error (same as E100)	0100	IP-ED PCB RAM error or not connected
0002	Density conversion RAM error		
0004	B shading correction RAM error	0400	IP-PRJ PCB error or not connected
0008	G shading correction RAM error	0800 1000	IP-IF PCB RAM error
0010	R shading correction RAM error		
0020	Color correction RAM error		
0040	Scanning motor error		

Table 3-1104

Reference:

1. To reset the machine after self diagnosis, turn off the machine once.
   This, however, will not work for errors represented by 'E000'. This is to prevent damage to the fixing roller that would occur if the user were allowed to reset E000 errors without correcting the cause (thermistor, for example).
2. If 'E005" is noted indicating that the cleaning belt has been used up, replace the belt and execute 'E005-RLS' of 'FUSER' under 'FUNCT'.
3. You can check the data for the most recent E-indication after resetting the machine by turning it off using 'JAM/ERROR' under 'DISPLAY' of service mode.

Clearing E000

1) Activate service mode, and select 'FUSER' under 'FUNC'.
2) Press 'E000-RLS'.
3) Turn off and then on the power switch.

Clearing E005

1) Replace the cleaning belt.
2) Activate service mode, and select 'FUSER' under 'FUNC'.
3) Press 'E005-RLS'.
4) Turn off and then on the power switch.

Clearing E008

1) Supply fixing oil to the fixing oil case.
2) Turn off and then on the power switch.
   - Oil will be supplied automatically without clearing the 'E008'; the operation will end in about 10~15 min.
3) Turn off and then on the power switch.

Clearing E717

1) Activate service mode, and press 'B-CLR' of 'DATA-CON' under 'OPTION'. Or, clear the RAM on the reader controller PCB.

Self Diagnosis in RDFs

The microprocessor on the RF controller PCB is provided with a mechanism which automatically checks the state of the machine (sensors, in particular). When it identifies an error, it indicates the nature of the error on the copier's control panel in the form of a code.

Code	Main Cause	Description
E400	• Data communication (with copier)	• The communication is monitored at all times, and an error is identified when there is an interruption of 5 sec or more.
E401	• Pick-up motor (M1; faulty) • Pick-up roller home position sensor 1 (S8; faulty)	• The state of the sensor does not change when the pick-up motor has been driven for 2 sec or more.
E402	• Belt motor (M3; faulty) • Belt motor clock sensor (S11; faulty)	• The number of belt motor clock pulses is below a specific value for 100 ms.
E403	• Reversing motor (M2; faulty) • Slip sensor (S10; faulty)	• The number of slip clock pulses is below a specific value for 100 ms.
E404	• Delivery motor (M5; faulty) • Delivery motor clock sensor (S12; faulty)	• The number of delivery motor clock pulses is below a specific value for 200 ms.
E405	• Pick-up motor (M1; faulty) • Pick-up motor clock sensor (S9; faulty)	• The number of pick-up motor clock pulses is below a specific value for 200 ms.
E407	• Tray up/down motor (M6; faulty) • Tray position sensor (S25; faulty)	• The state of the sensor does not change when the tray up/down motor has been driven for 2 sec or more.
E408	• Feeding motor (M8; faulty) • Feeding motor clock sensor (S22; faulty)	• The number of feeding motor clock pulses is below a specific vaue for 100 ms.
E411	• Registration sensor 1 (S3; faulty) • Skew sensor 1 (S4; faulty) • Manual registration sensor (S19; faulty) • Image leading edge sensor (S20; faulty) • Original sensor 1 (S1; faulty)	• The output of each sensor is more than a specific value in the absence of paper.

Note:

1. When the self diagnosis mechanism has been activated, you may reset it by turning off the copier's power switch.
2. You may continue to make copies while the RF is out of order by opening the RF and placing the original on the copyboard glass.

Self Diagnosis in Sorters

Code	Error	Description
E510 (10H)	• The feeding motor (M1) fails to rotate.	• The clock signal from the clock sensor (PI5) of the feeder motor is absent for 250 ms or more.
E516 (16H)	• The low-speed feeding motor (M10) fails to rotate.	• The clock sensor (PI23) of the low-speed feeding motor does not generate clock signals for 250 ms or more.
E517 (17H)	• The pressure cam of the buffer pass unit does not detect home position.	• The home position is not detected within a specific period of time* after a press on the Copy Start key. *Varies depending on the copier.
E522 (22H)	• The push bar motor (M7) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated.
E523 (23H)	• The reference wall motor (M6) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated.
E524 (24H)	• The multiple guide motor (M5) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated.
E525 (25H)	• The automatic adjustment mechanism for the bin inside paper sensor 1 (S3, S4) has failed.	• The bin inside paper sensor 1 (S3, S4) cannot be adjusted automatically or an error exists in the automatic adjustment value.
E526 (26H)	• The automatic adjustment mechanism for the bin inside paper sensor 2 (S6, S7) has failed.	• The bin inside paper sensor 2 (S6, S7) cannot be adjusted automatically or an error exists in the automatic adjustment value.
E530 (30H)	• The guide bar motor (M8) fails to rotate.	• The operation does not end within a specific period of time after the motor drive signal has been generated. time: 5000 ms for front retrieval mode 2000 ms in other mode

Code	Error	Description
E531 (31H)	• The stapler unit swing motor (M4) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated. • The clock signal from the clock sensor (PI8) of the motor is absent for 250 ms or more. • The input signal from the swing home position sensor (PI9) does not change for 1000 ms or more.
E532 (32H)	• The stapler unit drive motor (M3) fails to rotate.	• The operation does not end within 5000 ms after the motor drive signal has been generated.
E533 (33H)	• The automatic adjustment mechanism for the stapler inside paper sensor has failed.	• The stapler inside paper sensor cannot be adjusted automatically or an error exists in the automatic adjustment value.
E540 (40H)	• The bin drive motor (M9) fails to rotate.	• The operation does not end within a specific period of time after the motor drive signal has been generated. time: 20000 ms for initialization 2000 ms for others • The clock signal from the clock plate sensor of the motor is absent for 250 ms or more. • The input signal from the lead cam position sensor (PI20) does not change for 2000 ms.
E550 (50H)	• The DC output from the sorter controller PCB is faulty.	• An error has occured in the DC output (24VL, 24VP) of the sorter controller PCB.

CHAPTER 4

MECHANICAL SYSTEM

This chapter describes the copier's mechanical characteristics and how to disassemble and assemble it. Keep the following in mind when disassembling and assembling the copier's mechanical parts:

1. Disconnect the power plug before disassembling or assembling the mechanical parts.
2. Unless otherwise specified, assemble the mechanical parts as you have disassembled them but only in reverse.
3. Identify the screws by type (length, diameter) and location.
4. One of the mounting screws used for the covers is equipped with a washer to protect against static electricity. Do not forget to use the washer when assembling the covers.
5. Use a washer for a screw for grounding wire and varistor to ensure electrical continuity.
6. As a rule, do not operate the copier with any of its parts removed.
7. When the left front door is opened, the left door switch is turned off and the laser shutter is closed. To operate the copier with the left front door open, you must insert the door switch actuators into the left door switch and the laser shutter. At such times, do not use a screwdriver or the like that can block the laser path.
8. The one-way clutch is in operation when the transfer drum is on the transfer assembly frame; do not turn the transfer drum with a finger near the transfer drum (windows, for example).
   When the transfer drum is off the frame, on the other hand, the transfer drum will rotate in reverse, damaging the transfer brush, retention brush, and transfer drum side scraper.
9. Some steps used to disassemble/assemble the machine differ depending on the type of machine; such steps are identified by notation TYPE1/TYPE2 in this manual:

Model	CLC700		CLC800	
TYPE	TYPE1	TYPE2	TYPE1	TYPE2
115V (TWN)	NCN xxxx	NKN xxxx	NCT xxxx	NKT xxxx
115V (USA)	NCL xxxx	NKL xxxx	NCS xxxx	NKS xxxx
230V (KOR)	———	PKR xxxx	———	———
230V (Others)	PCN xxxx	PKN xxxx	PCS xxxx	PKS xxxx
230V (UK)	QCQ xxxx	QKQ xxxx	QCS xxxx	QKS xxxx
230V (CA)	RCQ xxxx	RKQ xxxx	RCS xxxx	RKS xxxx
230V (FRN)	SCR xxxx	SKR xxxx	SCS xxxx	SKS xxxx
230V (GER)	TCR xxxx	TKR xxxx	TCS xxxx	TKS xxxx
230V (AMS)	UCR xxxx	UKR xxxx	UCS xxxx	UKS xxxx

10. When replacing the laser scanner unit, hold it on its metal plates and mold members, while avoiding contact with the laser scanner controller PCB, laser scanner drive PCB, and the lens assembly. In addition, when replacing the laser scanner controller PCB, do NOT touch any of its elements.

- I. EXTERNALS 4-1
- II. DRIVE SYSTEM 4-15
- III. FEEDING SYSTEM 4-35
- IV. EXPOSURE SYSTEM 4-70
- V. CHARGING SYSTEM 4-73
- VI. DEVELOPING SYSTEM 4-80
- VII. FIXING SYSTEM 4-88
- VIII. DUPLEXING UNIT 4-97
- IX. ELECTRICAL SYSTEM 4-103
- X. EDITOR 4-108
- XI. OTHERS 4-110
- XII. STANDARDS AND ADJUSTMENTS 4-120

I. EXTERNALS

A. Covers

1. External Covers

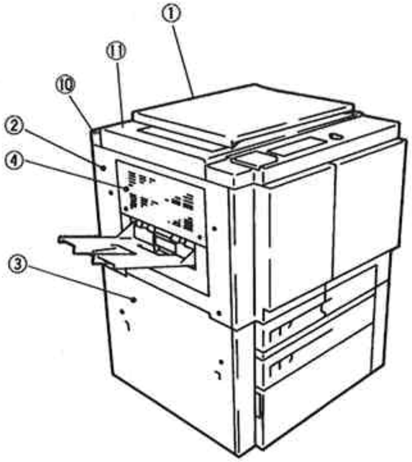


Figure 4-101 (a) (CLC700)

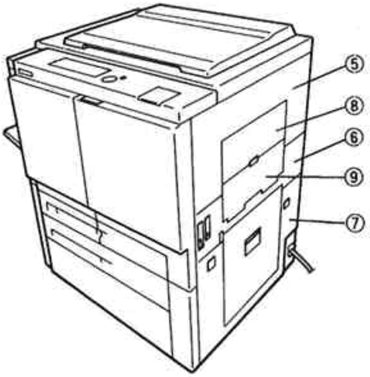


Figure 4-101 (b)

① Rear cover (5)
② Upper left cover (4)
③ Lower left cover (2)
④ Delivery upper cover (20)
⑤ Upper right cover (2)
⑥ Middle right cover (2)
⑦ Lower right cover (2)
⑧ Reader controller cover (2)
⑨ Multifeeder cover (2)
⑩ Upper rear cover (3)
⑪ Upper cover (11)

Reference:

The number in parentheses indicates the number of mounting screws used for the cover; note that the screw used to install the rear cover is equipped with a washer.

Remove the covers as necessary to clean, inspect, or repair the inside of the machine.

Those that can be removed by mere removal of the screws are omitted from the instructions.

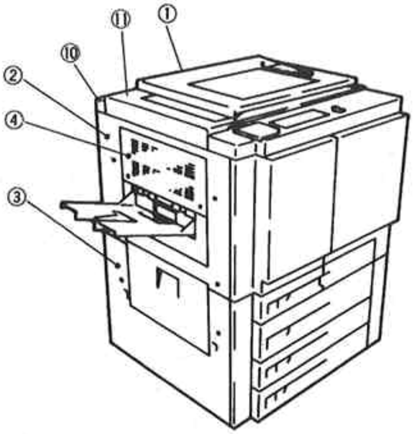


Figure 4-102 (a) (CLC800)

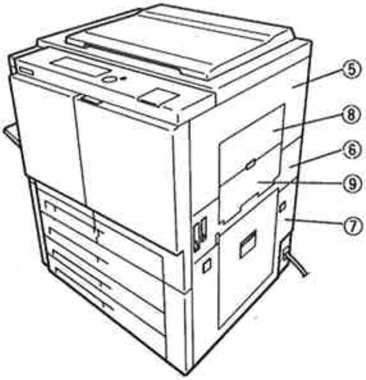


Figure 4-102 (b)

① Rear cover (5)
② Upper left cover (4)
③ Lower left cover (2)
④ Delivery upper cover (2)
⑤ Upper right cover (2)
⑥ Center right cover (2)
⑦ Lower right cover (2)
⑧ Reader controller cover
⑨ Multifeeder cover (2)
⑩ Upper rear cover (3)
⑪ Upper cover (11)

Reference:

The number in parentheses indicates the number of mounting screws used for the cover; note that the screw used to install the rear cover is equipped with a washer.

Remove the covers as necessary to clean, inspect, or repair the inside of the machine.

Those that can be removed by mere removal of the screws are omitted from the instructions.

2. Inside Left Cover

1) Remove the four screws ①.

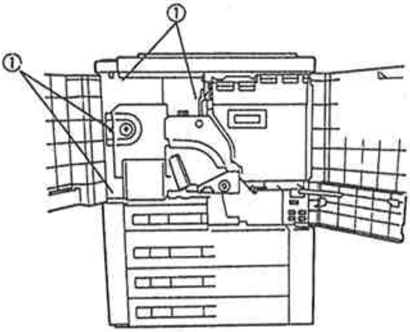


Figure 4-103

2) Slide out the transfer assembly frame, and remove the inside left cover.

3. Transfer Assembly Frame Cover

1) Remove the transfer drum rotating knob ①.
2) Remove the two screws ②, and remove the transfer frame cover ③.

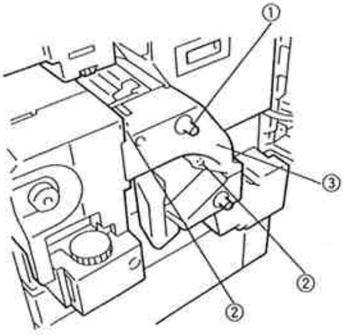


Figure 4-104

4. Fixing Assembly Cover

1) Remove the screw, and remove the fixing assembly knob ①.
2) Remove the two screws ②, and remove the fixing cover ③.

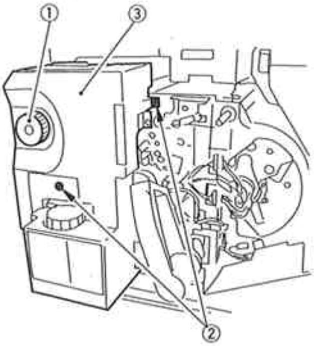


Figure 4-105

Caution:
Make sure that the hook at the bottom of the cover is properly fitted into the hole in the transfer assembly frame when attaching the fixing cover.

5. Transfer Assembly Frame Right Cover

1) Pull out the registration roller rotating knob.
2) Remove the two screws ①, and remove the transfer frame right cover ②.

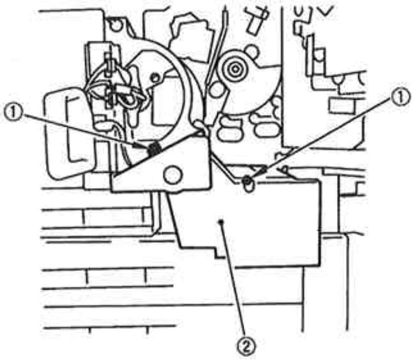


Figure 4-106

Caution:
Make sure that the hook at the bottom of the cover is properly fitted into the hole in the transfer frame when attaching the transfer assembly frame right cover.

6. Detaching the Copyboard Glass

1) Remove the two screws, and remove the copyboard glass (right).
2) Remove the copyboard glass by lifting its right end.

Reference:
Do not remove parts other than the copyboard glass retainer (right) when detaching the copyboard glass. When attaching it, take care so that it will not override the stop plate at the rear and front; butt it against the left rear when fixing it in place.

7. Detaching the Upper Cover

1) Remove the control panel.
2) Remove the copyboard glass.
3) Remove the three screws ① from the bottom of the control panel. (See Figure 4-108.)
4) Remove the three screws, and remove the rear upper cover.
5) Remove the two screws, and remove the vertical size plate.
6) Remove the face plates ② covering the projector screw holes using a flat-blade screwdriver.

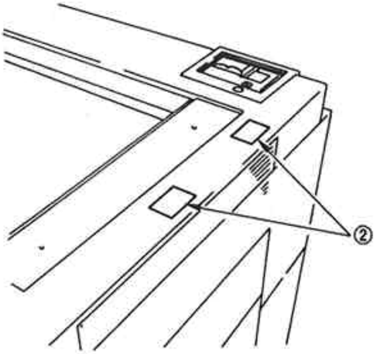


Figure 4-107

7) Remove the eight screws ③, and remove the upper cover ④.

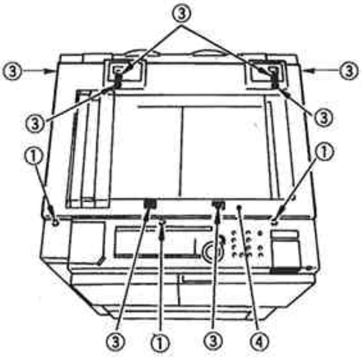


Figure 4-108

B. Control Panel

1. Detaching the Control Panel

1) Remove the four screws ①, and remove the control panel ②.

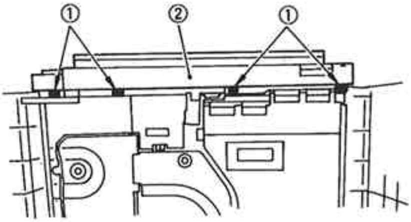


Figure 4-109

2. Detaching the Relay PCB

1) Remove the control panel, and turn it over.
2) Remove the harness (J5301) from the copier.
3) Disconnect the six connectors ① of the relay PCB (J5303, J5304, J5305, J5308, J5309, J5310).
4) Remove the five screws ②, and remove the extension control panel PCB, relay PCB, and grounding connecting plate ③.

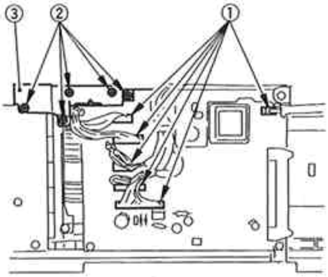


Figure 4-110

5) Remove the three fixing screws of the relay PCB.
6) Turn over the relay PCB.
7) Shift the fixing of the connector ④ of the flexible cable.
8) Pull out the flexible cable ⑤ carefully. (J5302, J5306).

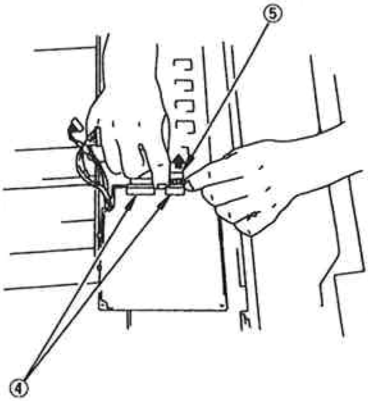


Figure 4-111

3. Detaching the LCD PCB

1) Remove the relay PCB.
2) Remove the five screws ①, and remove the LCD PCB ②, keypad PCB ③, and grounding connecting plate ④.

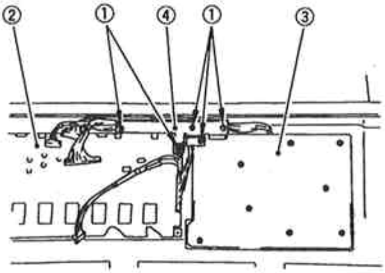


Figure 4-112

3) Remove the three screws, and remove the LCD PCB.

4. Detaching the Extension Control Panel PCB

1) Remove the relay PCB.
2) Remove the five screws ①, and remove the extension control panel PCB ②.

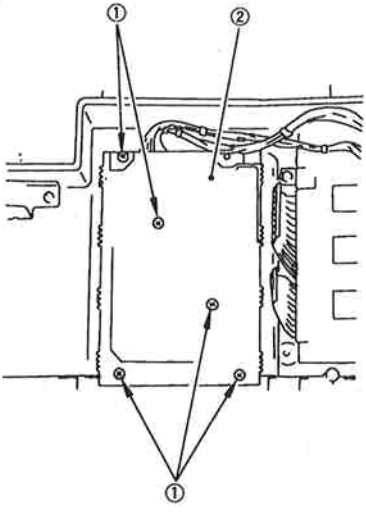


Figure 4-113

5. Detaching the Keypad PCB

1) Remove the relay PCB.
2) Remove the five screws ①, and remove the LCD PCB ②, keypad PCB ③, and grounding connecting plate ④.

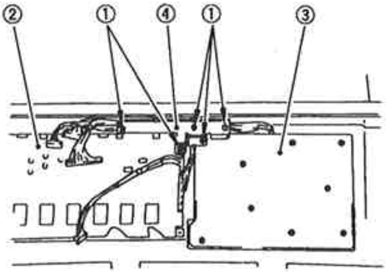


Figure 4-114

3) Remove the nine screws ⑤, and remove the keypad PCB ⑥.

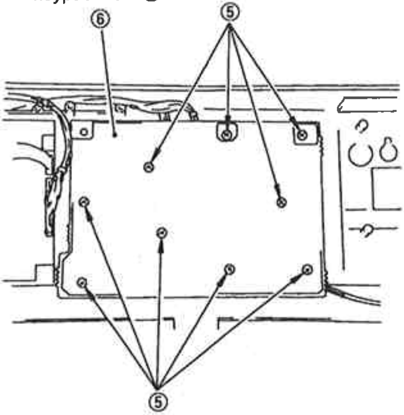


Figure 4-115

4) Remove the connecting harness connecting to the pilot lamp. (J5003)

C. Flywheel

1. Detaching the Flywheel

Caution:
The copier's three flywheels ① weigh 30 kg in total, each weighing 10 kg.
Take adequate care not to drop them; support them as shown in Figure 4-116.

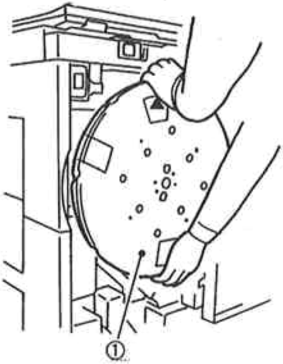


Figure 4-116

1) Remove the rear cover.
2) Remove the two screws ①, and remove the flywheel 1 ②.

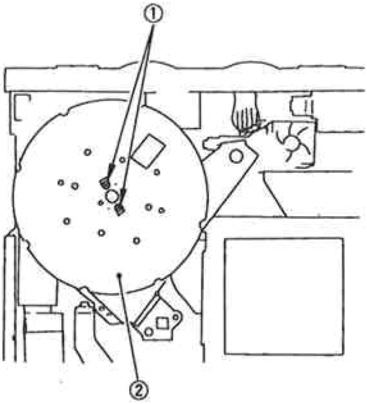


Figure 4-117

3) Remove the two screws, and remove the flywheel 2.
4) Remove the two screws ③, and remove the flywheel 3 ④.

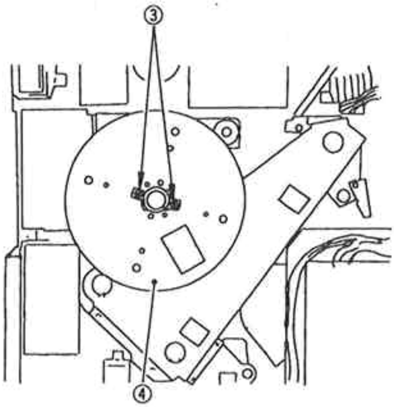


Figure 4-118

2. Points to Note When Attaching the Flywheel

- The flywheels 1, 2, and 3 have their own orientation; pay attention to their face and back, and install them so that the 10 kg label is in view.
- Put the flywheels 2 and 1 together so that the cut-outs will be positioned over mounting screws.

D. Fans

1. Outline

The copier is equipped with 14 fan motors to drive the fans, thereby circulating the air inside the machine and preventing overheating; the information that follows is limited to the major fans.

2. Primary Corona Assembly Fan (FM2)

The primary corona assembly fan unit q consists of two fans (large. small), and air filters.

a. Detaching the Air Filter

1) Remove the rear cover.
2) Remove the flywheels 1 and 2.
3) Remove the fan cover ①; then, remove the air filter ②.

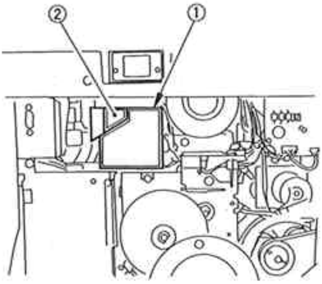


Figure 4-119

Caution:
You may remove the fan cover while lifting the top (see arrow) to facilitate the work.

b. Detaching the Primary Corona Assembly Fan (large; ③)

1) Remove the air filter.
2) Remove the upper rear cover.
3) Remove the three screws ④, and disconnect the connector ⑤; then, pull out the fan.

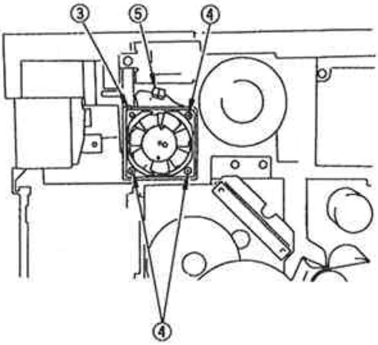


Figure 4-120

c. Detaching the Primary Corona Assembly (small; ⑥)

1) Remove the primary corona assembly fan (large).
2) Remove the four screws ⑦, and disconnect the connector ⑧; remove the fan together with its duct.

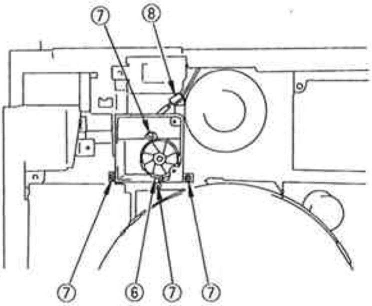


Figure 4-121

3) Remove the two screws, and remove the primary charging assembly fan (small) from the duct.

d. Points to Note When Attaching the Primary Corona Assembly Fan (large)

Caution:
Be sure to install the primary corona assembly fan (large) carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

3. Fixing Assembly Heat Exhaust Fan (FM3)

a. Detaching the Fixing Assembly Heat Exhaust Fan ①

1) Remove the rear cover.
2) Remove the ozone filter.
3) Remove the two screws ②, and disconnect the connector ③; then, pull out the fan from the duct.

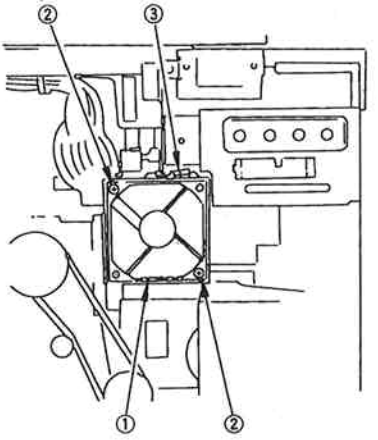


Figure 4-122

b. Points to Note When Attaching the Fixing Assembly Heat Exhaust Fan

Caution:
Be sure to install the fixing assembly heat exhaust fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

4. Ozone Exhaust Fan 1 (FM4)

a. Detaching the Ozone Filter

1) Remove the rear cover.
2) Remove the ozone filter ①.

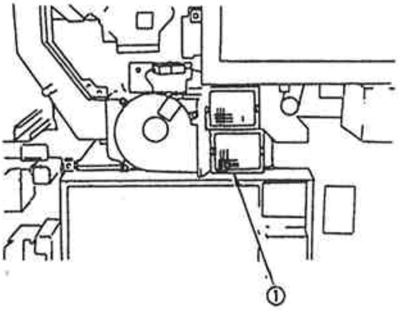


Figure 4-123

b. Detaching the Ozone Exhaust Fan 1

1) Remove the rear cover.
2) Remove the three screws ②, and disconnect the connector ③; then, remove the ozone exhaust fan ④.

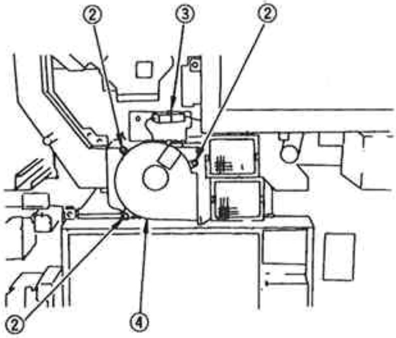


Figure 4-124

c. Detaching the Air Filter of the Ozone Exhaust Fan 1

1) Remove the rear cover.
2) Remove the ozone exhaust fan 1.
3) Remove the air filter ⑤.

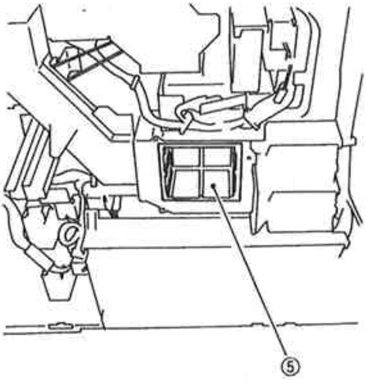


Figure 4-125

5. Ozone Exhaust Fan 2 (FM13)

a. Detaching the Ozone Filter

1) Remove the rear cover.
2) Remove the ozone filter ①.

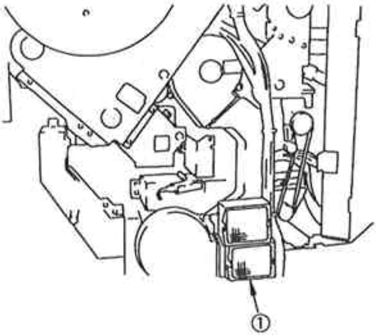


Figure 4-126

b. Detaching the Ozone Exhaust Fan 2

1) Remove the rear cover.
2) Remove the screw, and open the DC controller PCB.
3) Remove the three screws ②, and disconnect the connector ③; then, shift the ozone exhaust fan ④ to remove.

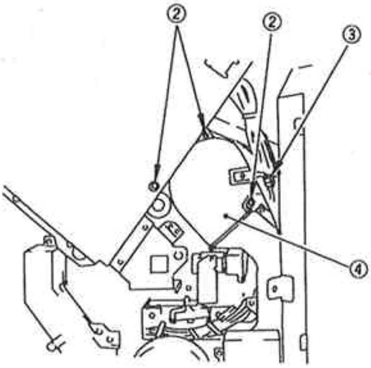


Figure 4-127

c. Detaching the Air Filter of the Ozone Exhaust Fan

1) Remove the rear cover.
2) Remove the ozone exhaust fan.
3) Remove the air filter ⑤.

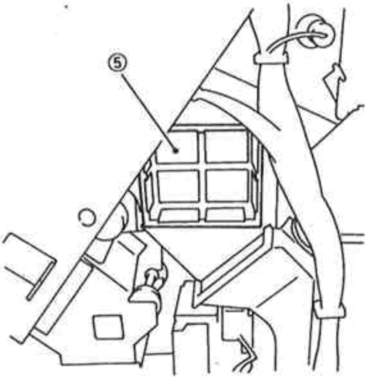


Figure 4-127-1

6. Electrical Unit Fan (FM10)

a. Detaching the Electrical Unit Fan (FM10)

1) Remove the reader controller cover.
2) Remove the upper right cover.
3) Remove the three screws ①, and remove the electrical unit fan mount ②.

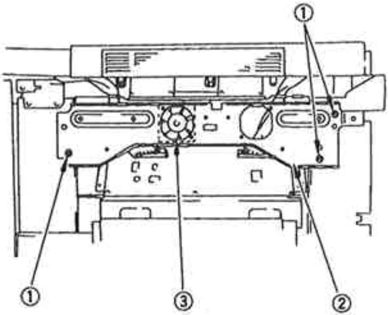


Figure 4-128

4) Remove the two screws, and disconnect the connector; then, remove the electrical unit fan ③.

b. Points to Note When Attaching the Electrical Unit Fan

Caution:
Be sure to install the electrical unit fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

7. Scanner Cooling Fan 1/2 (FM1/FM5)

a. Removing the Original Illumination System Cooling Fan 1/2

1) Remove the reader controller cover.
2) Remove the upper right cover.
3) Remove the two screws ①, and remove the scanner cooling fan cover ②.

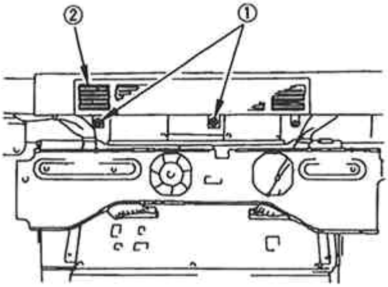


Figure 4-129

4) Remove the two screws (each) from the fan, and disconnect the connector; then, remove the fan.

b. Removing the Air Filter

1) Remove the two screws and disconnect the connector from each fan, and remove the fans.
2) Remove the air filter.

c. Points to Note When Attaching the Scanner Cooling Fan 1/2

Caution:
Be sure to install the scanner cooling fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

8. Scanner Cooling Fan 3/4 (FM6/7)

a. Removing the Scanner Cooling Fan 3/4

1) Remove the upper left cover.
2) Remove the two screws ①, and remove the scanner cooling fan cover ②.

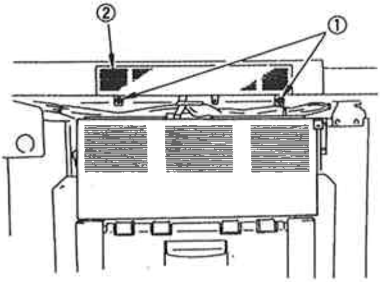


Figure 4-130

3) Remove the screw, and remove the interface harness retainer. (This step applies only when the IP-ED or IP-IF PCB is installed.)
4) Remove the two screws and disconnect the connector from each fan, and remove the fans.

b. Detaching the Scanner Cooling Fan 3/4

Caution:
Be sure to install the scanner cooling fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

9. IP Cooling Fan (FM9)

a. Detaching the IP Cooling Fan

1) Remove the inside left cover.
2) Remove the three screws ① and disconnect the connector; then, remove the IP cooling fan cover ②.

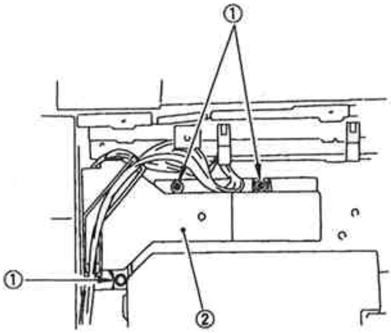


Figure 4-131

3) Remove the two screws, and remove the IP cooling fan.

b. Points to Note when Attaching the IP Cooling Fan

Caution:
Be sure to install the IP cooling fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

10. Feeding Fan 1/2 (FM14/15)

a. Detaching the Feeding Fan

1) Open the front door, and pull out the transfer assembly frame.
2) Put down the fixing assembly from the transfer assembly frame.
3) Put down the transfer drum unit from the transfer frame.
4) Put down the transfer assembly frame from the copier.
5) Remove the two screws ①, and disconnect the connector ②; then, remove the feeding fan ③.

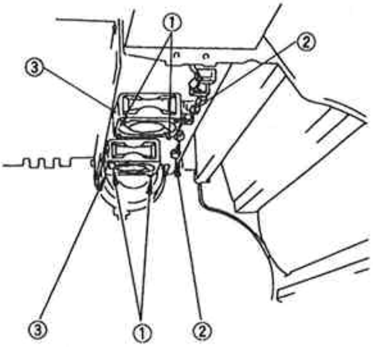


Figure 4-132

b. Points to Note When Attaching the Feeding Fan

Caution:
Be sure to install the feeding fan carefully orienting it for the direction of air, i.e., flowing from above to below; pay attention to the markings on the fan housing.

11. HVT PCB Cooling Fan (FM12)

a. Detaching the Developing Bias Power Supply PCB Cooling Fan

1) Remove the rear cover.
2) Disconnect the seven high-voltage connectors ① from the HVT PCB.
3) Disconnect the four connectors ② (J1, J2, J3/J5); then, remove the screw to remove the grounding wire.
4) Remove the three screws ③; then, remove the HVT PCB ④, and position it toward the front.

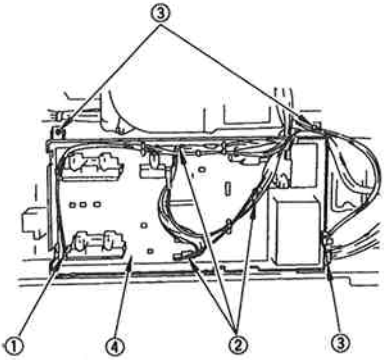


Figure 4-133

5) Disconnect the connector ⑤, and remove the screw ⑥; then, remove the fan ⑦ together with its mount.

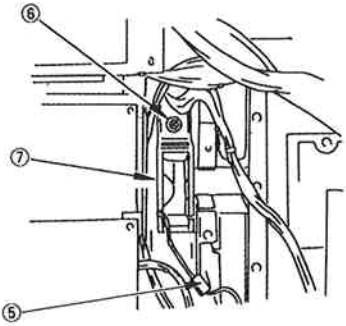


Figure 4-134

b. Points to Note When Attaching the Developing Bias Power Supply PCB

Caution:
Be sure to orient the power supply cooling fan so that it draws air from the direction of the power supply PCB; pay attention to the markings on the fan housing.

12. Power Supply Cooling Fan (FM8)

a. Detaching the Power Supply Cooling Fan

1) Remove the lower left cover.
2) Remove the two screws ①, and disconnect the connector ②; then, pull out the power supply unit.

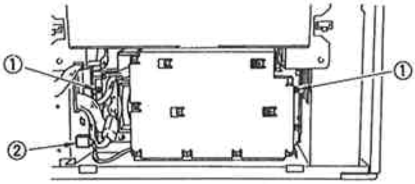


Figure 4-135

3) Disconnect the eight connectors (J22, J24, J23, J27, J28, J25, J26, J29), and disconnect the relay connector.
4) Disconnect the connector, and remove the two screws; then, remove the power supply cooling fan.

b. Points to Note When Attaching the Power Supply Cooling Fan

Caution:
Be sure to install the power supply cooling fan carefully orienting it for the direction of air, i.e., toward the power supply PCB; pay attention to the markings on the fan housing.

II. DRIVE SYSTEM

A. Drive System Belt Layout

- The copier's drive belts are arranged as follows:

① Belt for developing assembly, registration assembly, and photosensitive drum cleaner
② Belt for feeding assembly and delivery/feeding assembly
③ Belt for pick-up assembly
④ Belt for duplexing unit feeding assembly

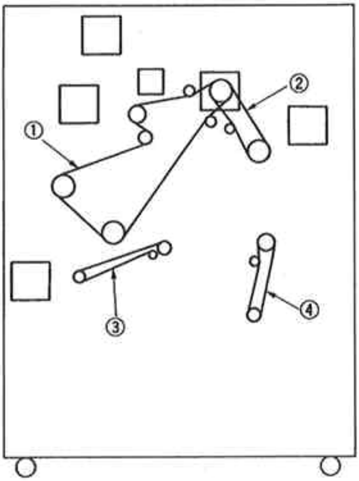


Figure 4-201

B. Drum Motor Assembly

1. Detaching the Drum Motor (M2)

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

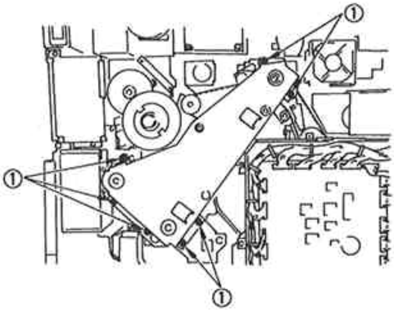


Figure 4-202

5) Remove the two screws ②, and disconnect the three connectors ③; then, remove the lamp regulator PCB ④.

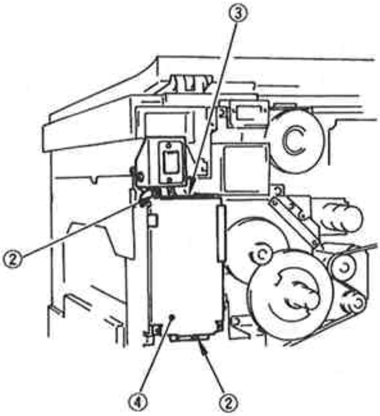


Figure 4-203

6) Remove the sensor flag, remove the screw ⑤, and remove the two hex screws ⑥; then, remove the gear ⑦ installed to the drum shaft.

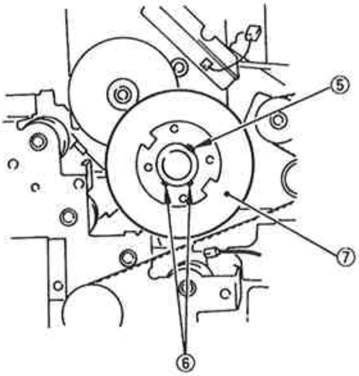


Figure 4-204

7) Remove the screw ⑧, and disconnect the connector ⑨; then, remove the photosensitive drum home position sensor together with its mount ⑩.

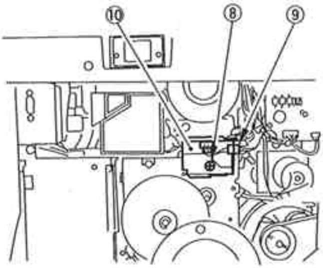


Figure 4-205

8) Disconnect the three connectors ⑪, and remove the seven screws ⑫; then, remove the drum motor together with its mount.

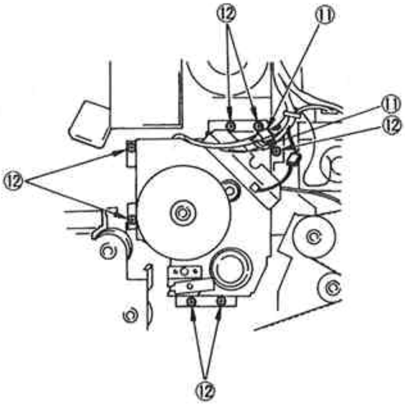


Figure 4-206

9) Remove the four screws, and remove the drum motor from its mount.

Caution

Go through the following steps when installing the drum motor assembly to the machine:

1) Remove the six screws ①, and remove the butting block ②; then, remove the photosensitive drum ③ from the photosensitive drum frame unit ④.

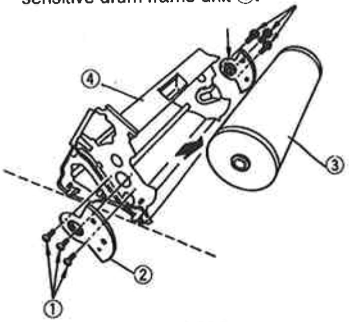


Figure 4-207

3) Insert the photosensitive drum frame unit ⑤ into the machine, and fix it in place using three screws ⑥.

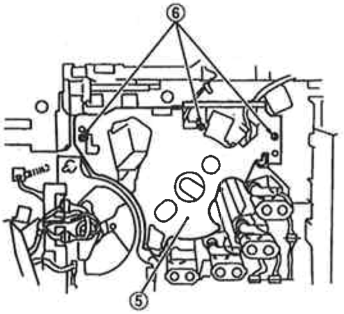


Figure 4-208

4) Temporarily fix the drum motor assembly ⑦ using seven screws ⑧. (If the drum shaft support fixing ⑨ is found, remove it.)

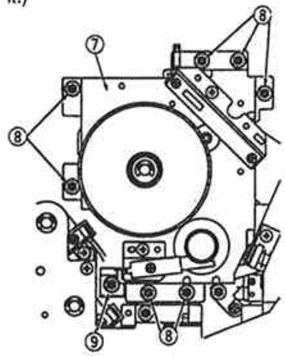


Figure 4-209

5) Attach the drum shaft positioning tool (FY9-3016-000; ⑩) to the photosensitive drum frame unit ⑫ using the two screws ⑪ removed in step 2).

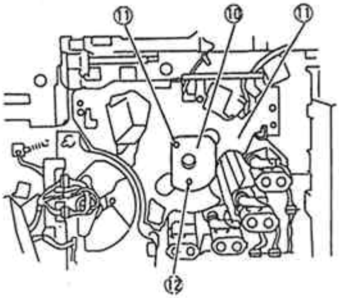


Figure 4-210

6) Fix the drum motor assembly and the drum shaft support plate fixing securely using eight screws.
7) Detach the drum shaft positioning tool, and slide out the photosensitive drum frame unit from the machine; then, install the unit and parts removed in step 1).

2. Detaching the Drum Home Position Sensor

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the sensor flag ①. (TYPE 2 only)

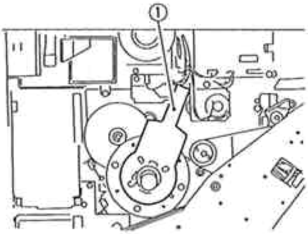


Figure 4-211

4) Disconnect the connector ②, and remove the screw ③; then, remove the drum home position sensor ④ together with its mount. (TYPE 1 only)

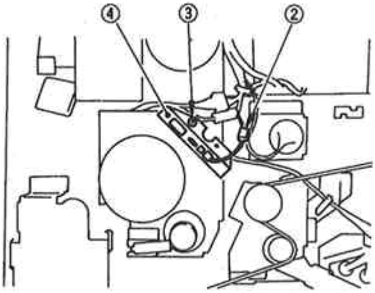


Figure 4-212

5) Remove the screw ⑤, and disconnect the connector ⑥; then, remove the photosensitive drum home position sensor together with its mount ⑦.

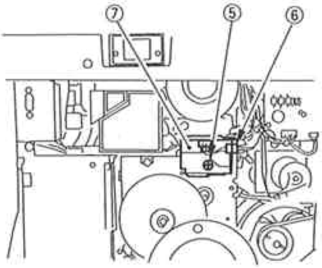


Figure 2-213

6) Remove the sensor from the mount.

3. Detaching the Drum Heater

1) Remove the drum.
2) Put the photosensitive drum with the drum heater friction plate at the bottom.
3) Remove the two screws ①, and remove the drum flange (front) ②.

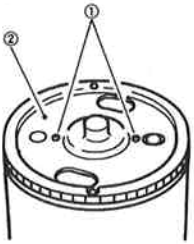


Figure 4-214

4) Disconnect the connector ③, and pull out the drum heater ④.

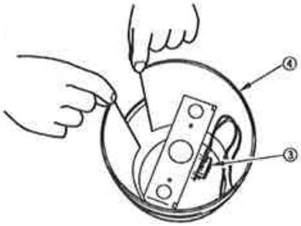


Figure 4-215

4. Detaching the Drum Heater Brush

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the drum motor. (See II-B-1.)
4) Remove the screw ①, and disconnect the two connectors ②; then, remove the drum heater brush.

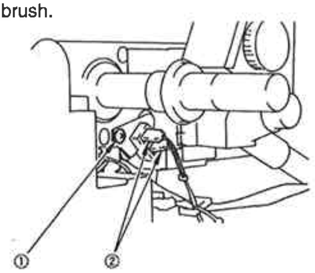


Figure 4-216

C. Main Motor (M4) Drive Assembly

1. Detaching the Main Motor (M4)

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the DC controller PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

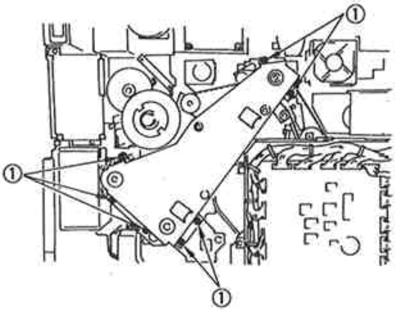


Figure 4-217

5) While holding the tensioner ② up, remove the drive belt 1 ③.

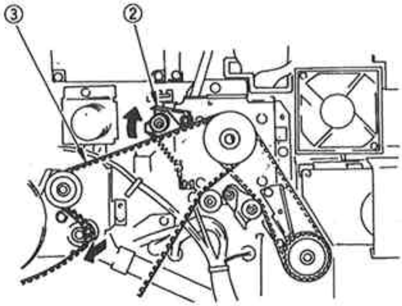


Figure 4-218

6) While pushing the tensioner ④ to the left, remove the drive belt 2 ⑤.

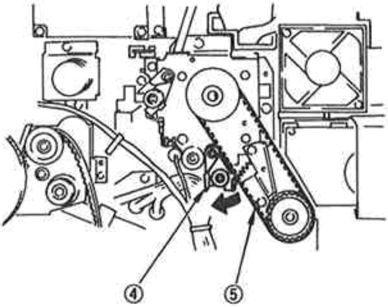


Figure 4-219

7) Disconnect the two connectors ⑥, and remove the four screws ⑦; then, remove the main motor together with its mount.

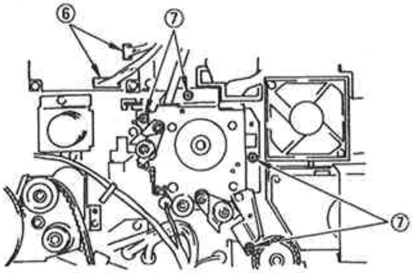


Figure 4-220

8) Remove the four screws, and remove the main motor from its mount.

D. Fixing Assembly Motor (M5) Drive Assembly

1. Detaching the Fixing Assembly Motor (M5)

1) Remove the rear cover.
2) Remove the screw, and open the DC controller PCB.
3) Remove the fixing assembly motor cover. (Pull it out toward the front while opening it up and down.)
4) Disconnect the two connectors ①, and remove the four screws ②; then, pull out the PCB from the locking support ③ to remove the fixing motor together with its mount.

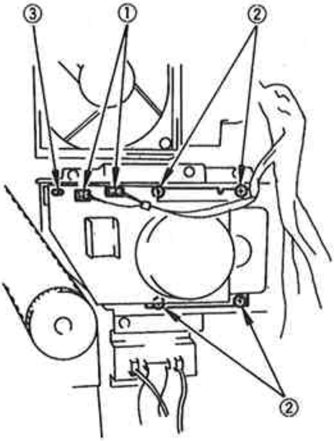


Figure 4-221

E. Pick-Up Motor (M6) Drive Assembly

1. Detaching the Pick-Up Motor

1) Remove the lower right cover.
2) Remove the rear cover.
3) Draw out the cassette 2 or the duplexing unit; then, remove the cassette 2 pick-up assembly or the duplexing unit pick-up assembly.
4) Remove the two screws ①, and remove the duct ② of the ozone exhaust fan.

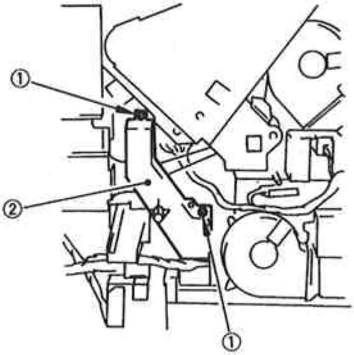


Figure 4-222

5) While releasing the tensioner ③, remove the cassette 1 pick-up assembly drive belt ④.

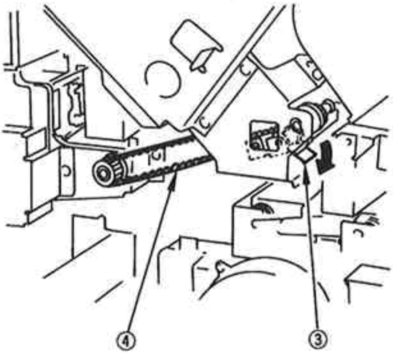


Figure 4-223

6) Free the harness from the locking support ⑤, and remove the locking support.

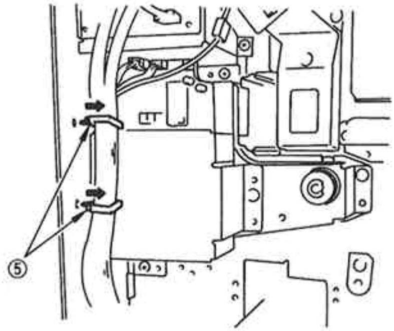


Figure 4-224

7) Remove the two screws ⑥, and remove the grip ⑦ for transport.

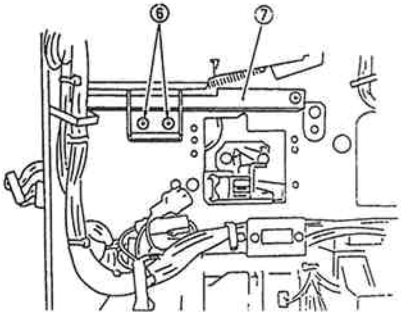


Figure 4-225

8) Disconnect the two connectors ⑧ and relay connector ⑨; then remove the three screws ⑩.

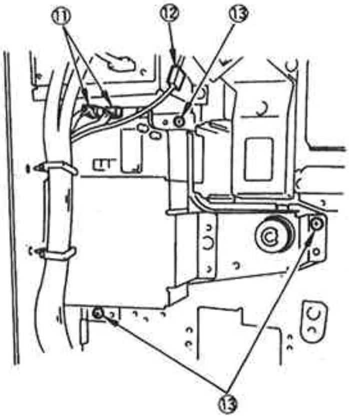


Figure 4-226

9) Release the gear ⑪ of the duplexing unit pick-up assembly/cassette 2 pick-up assembly toward above, remove the pick-up motor unit.

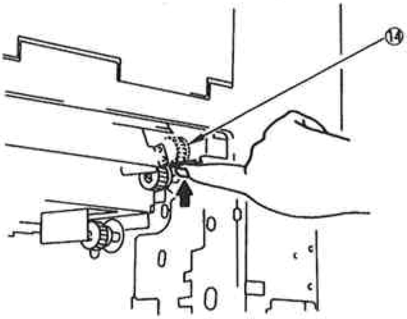


Figure 4-227

10) Remove the screw ⑫, and remove the pick-up motor cover ⑬ from the pick-up motor unit.

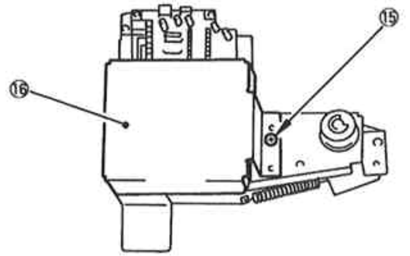


Figure 4-228

11) Remove the two screws ⑭, and remove the pick-up motor ⑮.

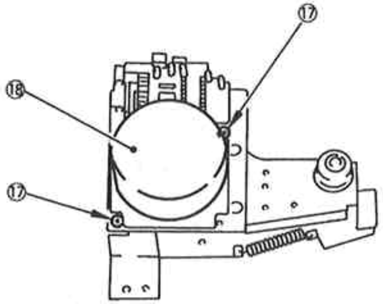


Figure 4-229

F. Developing Assembly Drive Assembly

1. Detaching the Developing Assembly Drive Assembly

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the DC controller PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

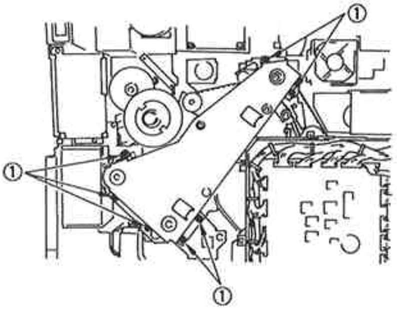


Figure 4-230

5) Remove the two screws ②, and disconnect the three connectors ③; then, remove the lamp regulator PCB ④.

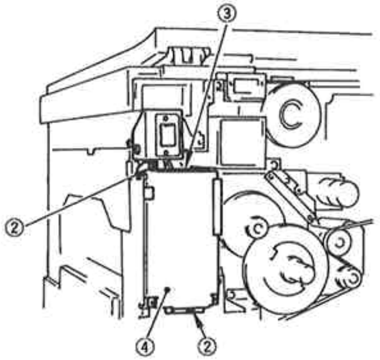


Figure 4-231

6) While holding the tensioner ⑤ up, remove the drive belt 1 ⑥.

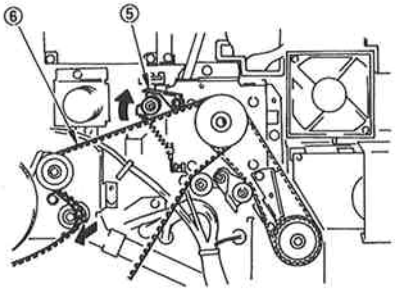


Figure 4-232

7) Disconnect the four connectors ⑦, and remove the two screws ⑧; then, remove the potential measuring PCB ⑨.

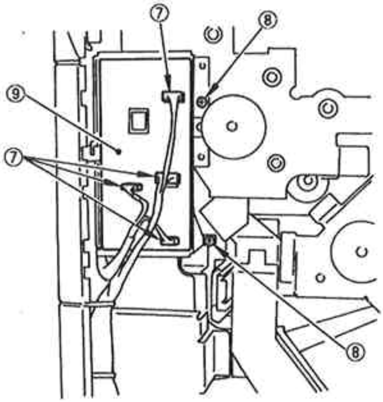


Figure 4-233

8) Open the locking support ⑩, and disconnect the four developing bias high-voltage connector ⑪.

9) Disconnect the two relay connectors ⑫.

10) Disconnect the relay connector of the waste toner clogging detection switch.

11) Remove the three screws ⑬.

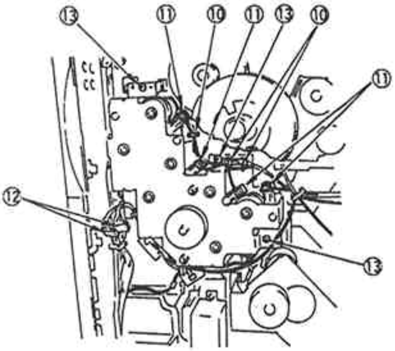


Figure 4-234

12) Shift the developing assembly drive unit up to remove.

> **Caution:**
> Note the hooks found at top/botton of the developing assembly drive unit when detaching or attaching it.

> **Caution:**
> If poor contact is noted between the developing assembly drive unit and the developing assembly high-voltage supply unit, or a development fault caused by such poor contact, replace the old parts with new ones as shown in XI "Others" in Chaper 4.

G. Photosensitive Drum Cleaner Assembly

1. Detaching the Photosensitive Drum Cleaning Drive Assembly/ Reciprocating Motor

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the DC controller PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

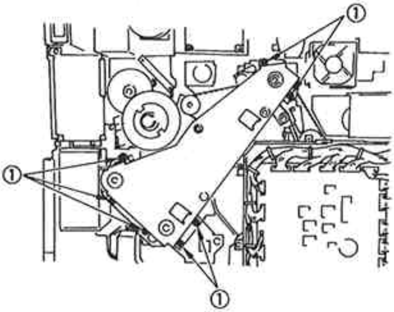


Figure 4-235

5) Remove the upper right cover.
6) Remove the screw ② and two hex screws ③, and remove the gear ④ installed to the drum shaft.

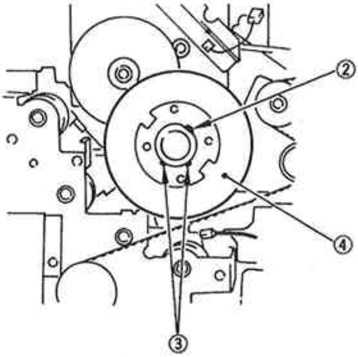


Figure 4-236

7) While holding the tensioner ⑤ up, remove the drive belt 1 ⑥.

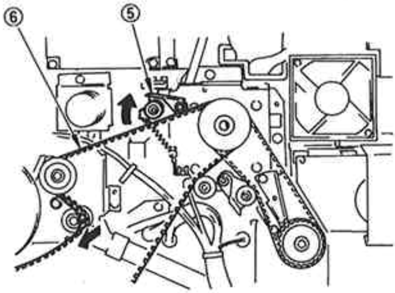


Figure 4-237

8) Disconnect the connector ⑦, and remove the two screws ⑧; then, remove the reciprocating motor.

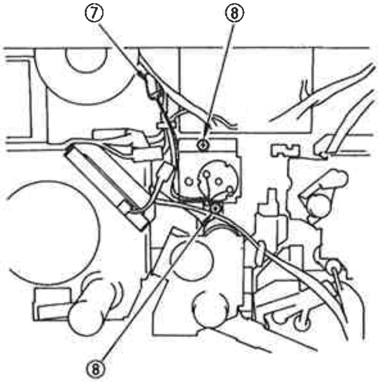


Figure 4-238

Caution:
The one-way clutch is in its active position when the transfer drum is on the transfer assembly frame; do not turn the transfer drum with your fingers inside the transfer drum.
Moreover, do not turn it when the transfer drum is off the transfer assembly frame; otherwise, the transfer drum will rotate in reverse, damaging the transfer brush or retention brush.

9) Remove the three screws ⑨, and remove the photosensitive drum cleaner drive assembly.

Caution:
Take adequate care not to drop the floating gear unit and three bushings inside the photosensitive drum cleaner drive assembly.

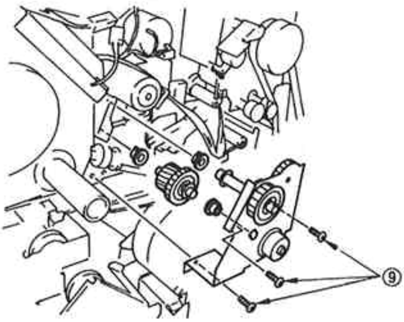


Figure 4-239

Caution:
If the reciprocating motor of the photosensitive cleaner assembly fails to turn off or on, the transistor on the DC controller PCB may be damaged. Be sure to replace the DC controller PCB as necessary.

H. Transfer Drum Cleaner Assembly

1. Removing the Polishing Roller

Caution:
Do not turn the transfer drum with your fingers in its window, as one-way clutch is active while the transfer drum remains fitted in the transfer assembly frame.
Likewise, take extra care after removing the transfer drum, as it will rotate in reverse, causing damage to the transfer brush and retention brush.

1) Detach the transfer drum from the transfer assembly frame.
2) Push the polishing roller toward the front of the transfer drum to remove.

Caution
Take care not to touch the transfer sheet.

2. Removing the Polishing Roller Motor

1) Detach the transfer drum from the transfer assembly frame.
2) Tilt the transfer drum unit as shown in Figure 4-239 to avoid damaging the transfer drum sheet. (If you can, put an object next to the rear side plate of the transfer drum unit.)
3) Remove the drive belt ① of the polishing roller motor, disconnect the connector ②, and remove the three screws ③; then, remove the motor ④.

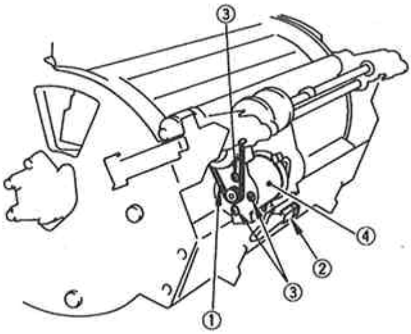


Figure 4-240

3. Detaching the Polishing Roller Unit

1) Remove the transfer drum from the transfer assembly unit.
2) Place the transfer drum unit on a level surface at an angle as shown in Figure 4-233 so as to avoid damage to the transfer drum sheet.
3) Remove the screw ①, and rotate the polishing roller lever ② counterclockwise to release the polishing roller.

Caution:
The four pins ③ used to keep the spring in place will slip off when the transfer drum is released; take care not to lose the pins.

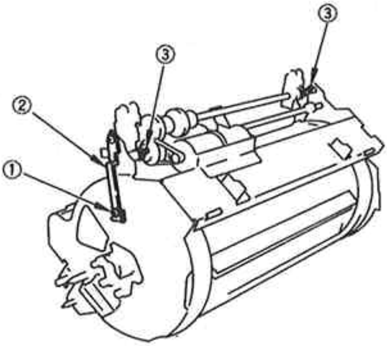


Figure 4-241

4) Remove the screw ④ and E-ring ⑤ (found on the inner side of the shaft 1); then, remove the shaft connecting member, and remove the gear unit 1 ⑥ together with its shaft.

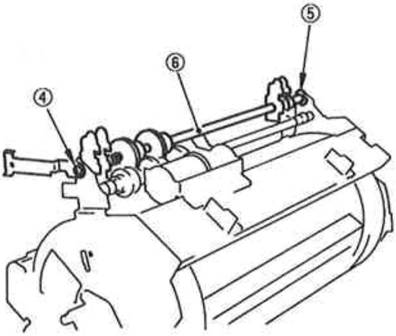


Figure 4-242

5) Remove the E-ring ⑦ (found on the outer side of the shaft 2) and the two screws ⑧; then, remove the polishing roller motor unit ⑨.

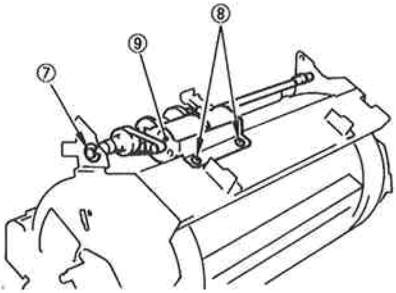


Figure 4-243

4. Detaching the Oil Removing Roller

1) Remove the transfer drum unit.
2) Remove the oil removing roller ① while pushing it against the rear.

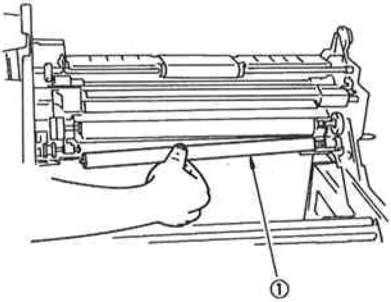


Figure 4-244

5. Detaching the Transfer Cleaner Unit

1) Remove the transfer drum unit.
2) Remove the oil removing roller while pushing it against the rear.
3) Remove the screw ①, and remove the external static eliminator ②.

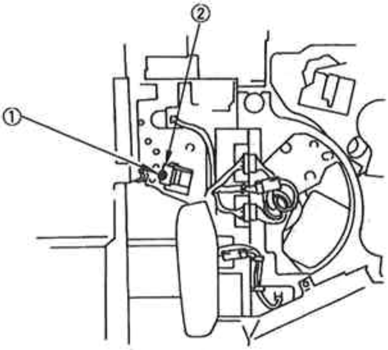


Figure 4-245

4) Remove the two screws ③, and remove the rail ④ of the external static eliminator.

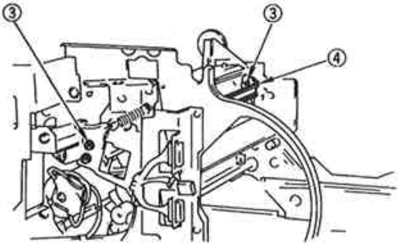


Figure 4-246

5) Remove the screw ⑤, and remove the bushing of the cleaner unit.
Disconnect the connector ⑥, and remove the screw to remove the metal fixing.

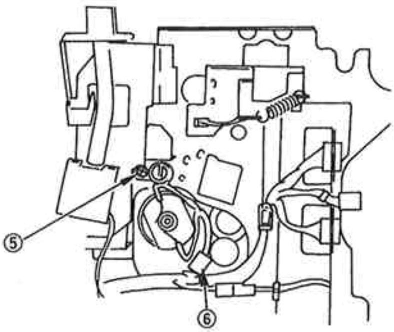


Figure 4-247

6) Remove the transfer cleaner unit ⑦ from the transfer assembly frame as shown in Figure 4-248.

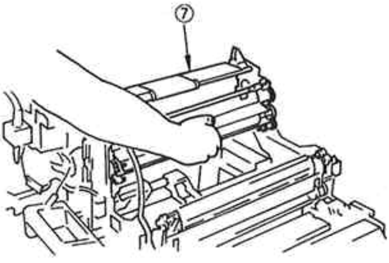


Figure 4-248

6. Detaching the Transfer Cleaner External Brush

1) Remove the transfer drum unit.
2) Remove the oil removing roller while pushing it against the rear.
3) Remove the transfer cleaner unit.
4) Remove the three screws ①, and remove the transfer cleaning unit upper cover ②.

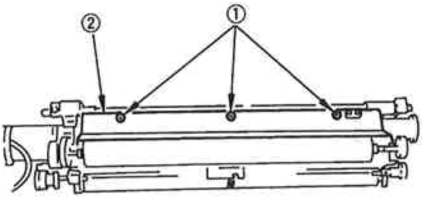


Figure 4-249

5) Remove the E-ring ③ from the rear of the transfer cleaner unit, and remove the spacer ④.

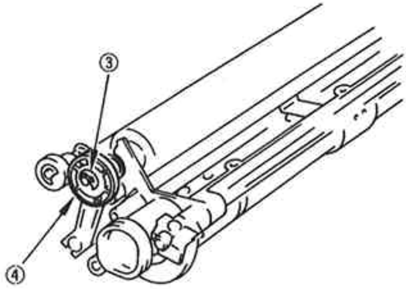


Figure 4-250

6) Remove the two E-rings from the front of the transfer cleaner unit; then, move the line of gears toward the rear, and pull out the parallel pin ⑥; and then remove the three gears ⑦, and remove the spacer ⑧.

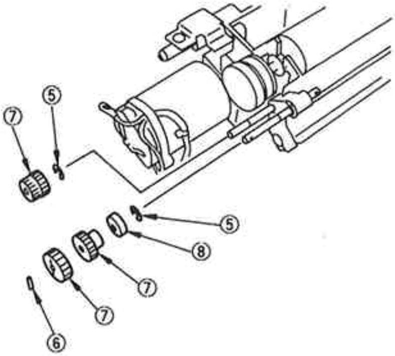


Figure 4-251

7) Remove the E-ring ⑨ and spacer ⑩.

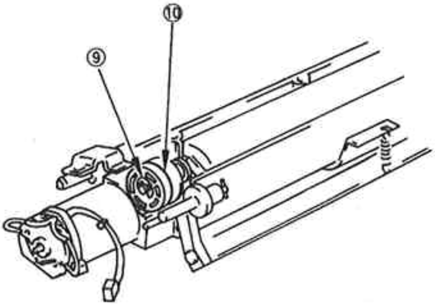


Figure 4-252

8) Remove the timing belt ⑪, and remove the gear ⑫. (At this time, take care not to drop the parallel pin ⑬.)

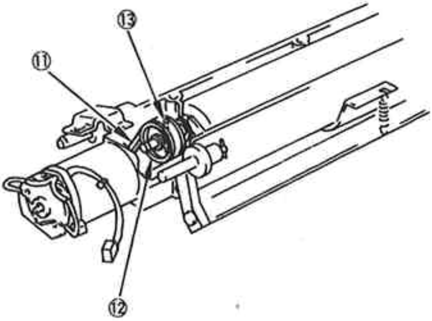


Figure 4-253

9) Remove the two E-rings ⑭, and remove the transfer cleaner external brush unit ⑯ while keeping the bearing ⑮ toward the outside.

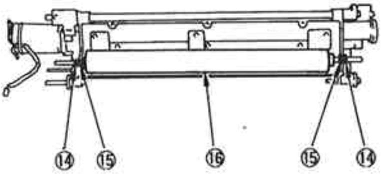


Figure 4-254

10) Loosen the hex screw ⑰ fully, and remove it; then, remove the transfer cleaner external brush ⑱. (Do not remove the E-ring ⑲.)

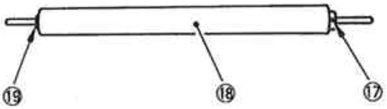


Figure 4-255

7. Detaching the Scraper (upper, lower) of the Transfer Cleaner Unit

1) Remove the transfer drum unit.
2) Remove the oil removing roller while pushing it against the rear.
3) Remove the transfer cleaner unit.
4) Remove the transfer cleaner external brush unit.
5) Remove the three screws ①, and remove the transfer cleaner cover ②.

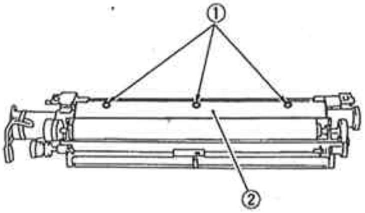


Figure 4-256

6) Remove the three screws ③, and remove the scraper (upper) ④.

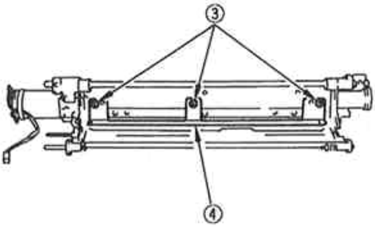


Figure 4-257

7) Remove the three screws ⑤, and remove the scraper (lower) ⑥.

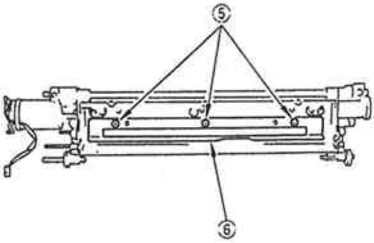


Figure 4-258

8. Removing the Transfer Drum Cleaner Motor

1) Remove the transfer drum unit.
2) Remove the transfer cleaner unit.
3) Remove the two screws ①, and remove the cleaner motor (M10).

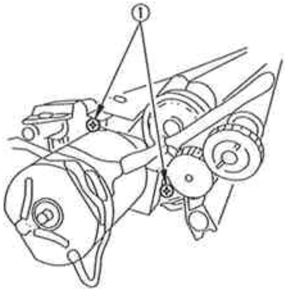


Figure 4-259

I. Scanner Assembly

1. Detaching the Scanner Drive Motor

1) Remove the rear cover, and remove the flywheels.
2) Remove the primary corona assembly fan. (See p. 4-8.)
3) Remove the four screws, and shift the scanner motor driver PCB to the right. (See p. 4-106/107.)
4) Remove the four screws ①, and remove the scanner drive motor ② together with its support plate.

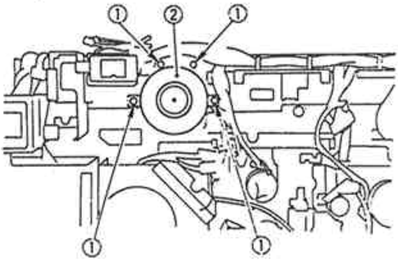


Figure 4-260

5) Remove the two screws, and remove the scanner drive motor from the support plate.

2. Adjusting the Belt Tension When Attaching the Scanner Drive Motor

1) Move the motor to the right, and tighten the screw.

3. Routing the Scanner Cable

You must have the mirror positioning tool (FY9-3002-000) handy when routing the scanner cable.

1) Remove the copyboard cover.
2) Remove the vertical size plate.
3) Remove the copyboard glass.
4) Remove the control panel.
5) Remove the upper rear cover.
6) Remove the upper cover.
7) Remove the two screws ①, and remove the standard white plate ②.

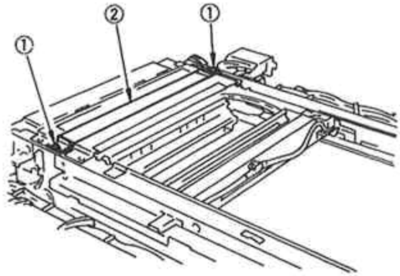


Figure 4-261

8) Remove the rear cover, and remove the flywheel.
9) Remove the three screw ③, and remove the DF mount ④ (rear left; fixing assembly side).

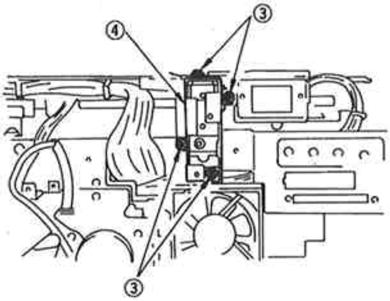


Figure 4-262

10) Move the No. 2 mirror mount, and position it so that its pulley shaft ⑤ is in view through the long hole in the side plate.

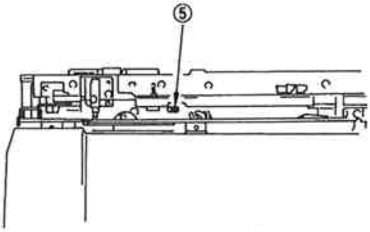


Figure 4-263 (front)

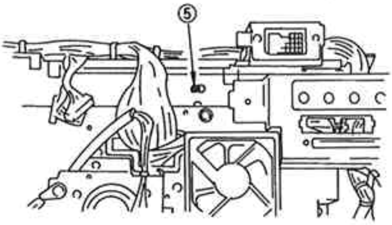


Figure 4-264 (rear)

11) Fit the binding screw ⑥ (M4x8) to the pulley shaft, thereby temporarily fixing the pulley to the side plate (front, rear) and ultimately to the No. 2 mirror mount.

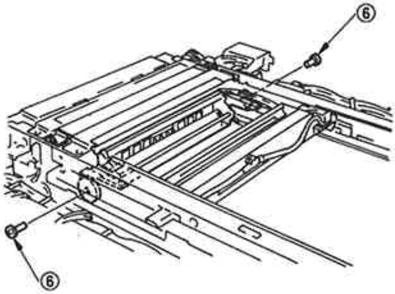


Figure 4-265

Caution:
When installing the standard white plate, make sure that the cut-off is toward the front as indicated.

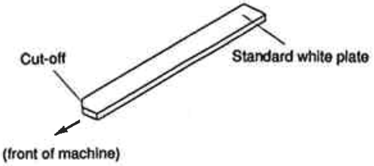


Figure 4-266

12) Engage the scanner cable to the pulley and the hook as indicated in Figure 4-267.

Caution:
Take care not to damage the wire by the edge of the metal plate.

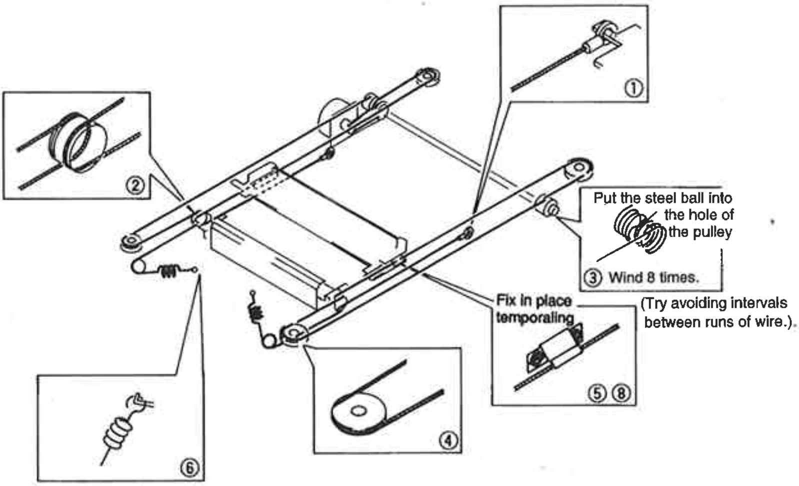

①
②
Put the steel ball into the hole of the pulley
③ Wind 8 times.
(Try avoiding intervals between runs of wire.)
Fix in place temporaling
⑤ ⑧
④
⑥

Figure 4-267

13) Remove the screw (front, rear) fitted in step 11).
14) Loosen the screws on the mirror positioning tool (FY9-3002-000), and fully extend the arm ⑦.

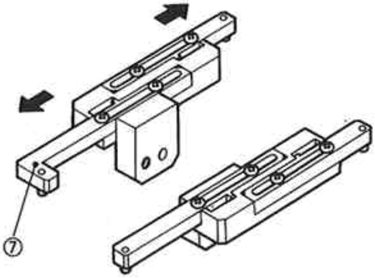


Figure 4-268

15) Fit the mirror positioning tool ⑧ between the No.1 mirror mount and the No.2 mirror mount, and insert the pin ⑨ found on the mirror positioning tool.

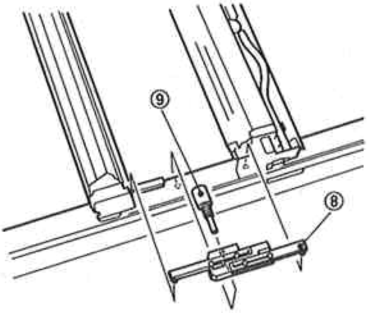


Figure 4-269 (front)

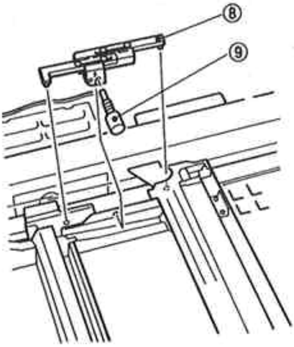


Figure 4-270 (rear)

16) Install the metal fixing ⑩ of the scanner cable to the No.1 mirror mount using screws ⑪ through the angle hole in the side plate.

Caution:
You must remove the scanner motor driver PCB and the main motor PCB when installing the metal fixing at the rear.

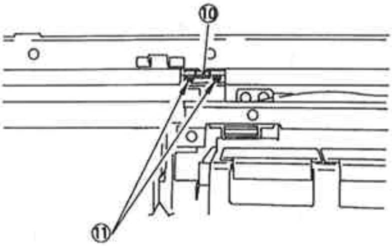


Figure 4-271 (front)

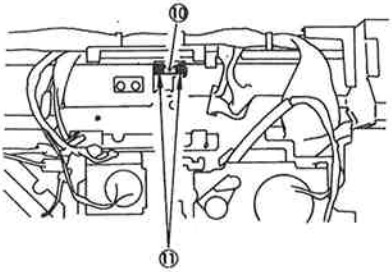


Figure 4-272 (rear)

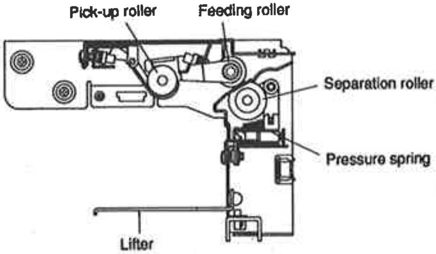
17) Remove the mirror positioning tool.

Reference:
You need not adjust the tension of the cable for the copier.

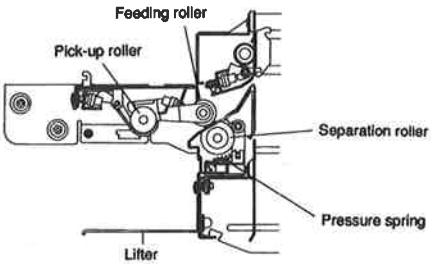
III. FEEDING SYSTEM

A. Pick-Up Assembly

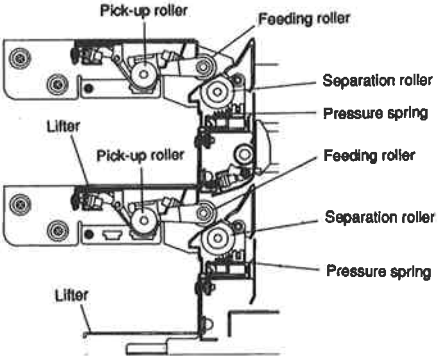
1. Construction


Pick-up roller
Feeding roller
Separation roller
Pressure spring
Lifter

Cassette 1 Pick-up Assembly


Feeding roller
Pick-up roller
Separation roller
Pressure spring
Lifter

Cassette 2 Pick-up Assembly


Pick-up roller
Feeding roller
Separation roller
Pressure spring
Lifter
Pick-up roller
Feeding roller
Separation roller
Pressure spring
Lifter

Cassette 3/4 Pick-up Assembly

Figure 4-3001

2. Detaching the Cassette 1 Pick-Up Assembly

1) Open the front door (left, right).
2) Slide out the cassette 1.
3) Remove the screw ①, and remove the cassette 1 pick-up assembly cover ②.

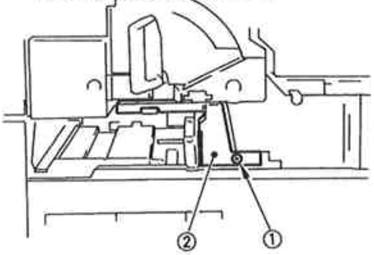


Figure 4-3002

4) Remove the duplexing unit/cassette 2. (See p. 4-100.)
5) Remove the screw, and remove the servicing document case cover; then, remove the two screws, and remove the stay. (CLC700 only)
6) Disconnect the connector ③, and remove the three screws ④; then, slowly slide out the cassette 1 pick-up assembly ⑤.

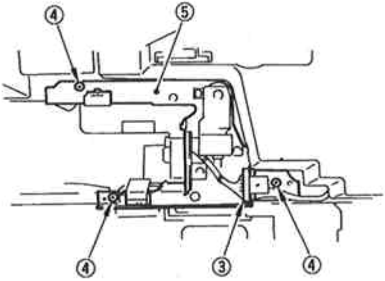


Figure 4-3003

3. Detaching the Cassette 2/ Duplexing Unit Pick-Up Assembly

1) Remove the lower right cover.
2) Slide out the cassette 2 or duplexing unit.
3) Disconnect the two connectors ①, and remove the four screws ②; then, slowly slide out the pick-up assembly to remove.

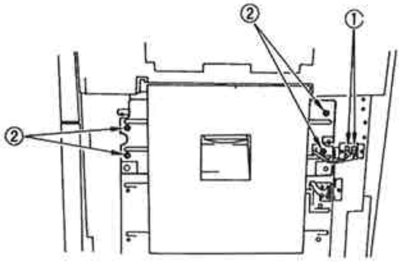


Figure 4-3004

Caution:
Note that the pick-up assembly slides out on its rails about 5 cm in length; it will slide out of the rails if pulled out any farther.

4. Detaching the Cassette 3/4 Pick-Up Assembly

1) Remove the lower right cover.
2) Remove the duplexing unit pick-up assembly.
3) Slide out the cassette 3 and cassette 4.
4) Disconnect the two connectors ①, and remove the four screws ②; then, slide out the pick-up assembly to remove.

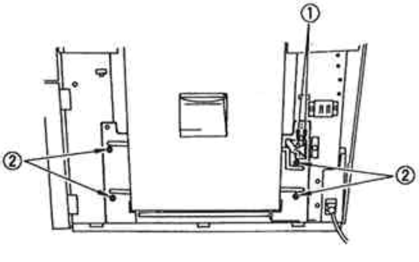


Figure 4-3005

Caution:
You must slide out the cassettes 1, 2, 3, and 4 when attaching each pick-up assembly.

5. Detaching the Pick-Up Roller

1) Remove the cassette 1/2/3/ pick-up assembly.
2) Remove the two E-rings ① (made of resin), and pull out the two pick-up rollers ② together with the collars.

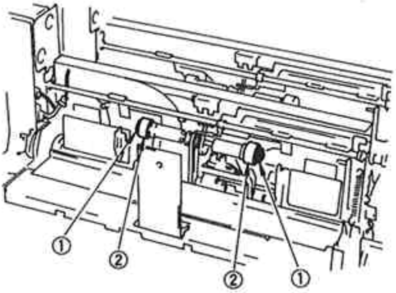


Figure 4-3006

Caution:

a. When attaching the pick-up roller ① to the pick-up assembly, make sure that the round marking ② on its rubber portion is toward the copier's front.

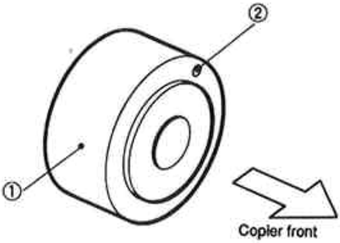


Figure 4-3007

The pick-up rollers are identified by color as follows:

- brass for the front
- silver for the rear

Make sure the correct rollers are used.

b. Do not remove the rubber portion of the pick-up roller from the collar.

6. Detaching the Cassette 1 Pick-Up Assembly Feeding Roller

1) Remove the cassette 1 pick-up assembly.
2) Remove the screw ①, and remove the pick-up assembly support plate ②.

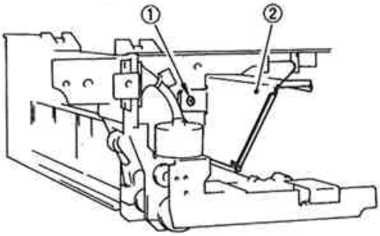


Figure 4-3008

3) Remove the screw ③, and remove the lower guide ④.

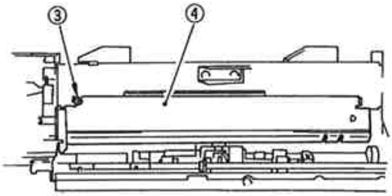


Figure 4-3009

4) Remove the screw ⑤, and remove the upper guide ⑥.

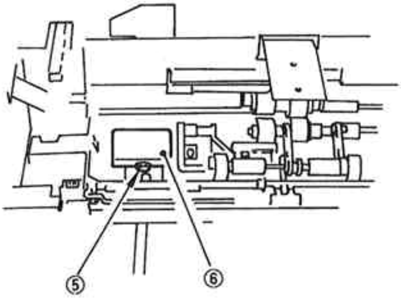


Figure 4-3010

5) Remove the screw ⑦, and remove the pick-up roller arm bushing ⑧.

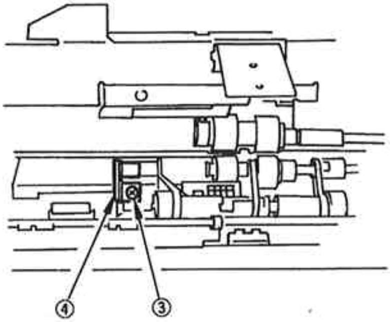


Figure 4-3011

6) Remove the E-ring ⑨ (made of resin), and remove the pick-up roller ⑩ from the rear.
7) Remove the E-ring ⑪ (made of resin).

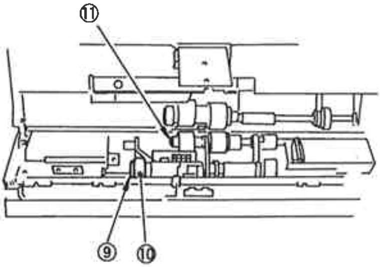


Figure 4-3012

8) Pull off the feeding roller ⑬ from the shaft together with the belt and pick-up roller shaft ⑫.

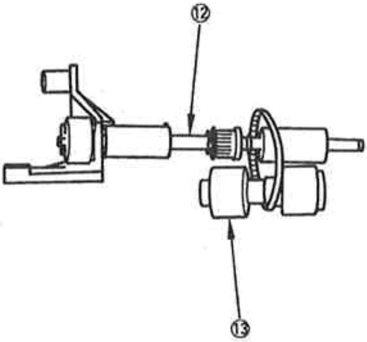


Figure 4-3013

7. Detaching the Cassette 2/3/4 Pick-Up Assembly Feeding Roller

1) Remove the cassette 2/3/4 pick-up assembly.
2) Remove the screw ①, and remove the upper guide ②.

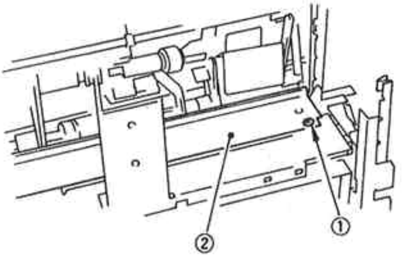


Figure 4-3014

3) Remove the screw ③, and remove the pick-up roller arm bushing ④.

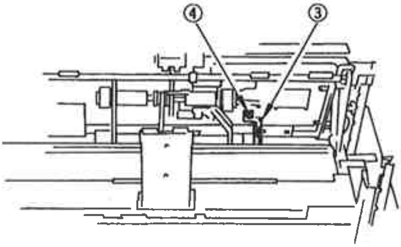


Figure 4-3015

4) Remove the E-ring ⑤ (made of resin), and remove the pick-up roller ⑥ from the rear.
5) Remove the E-ring ⑦ (made of resin).

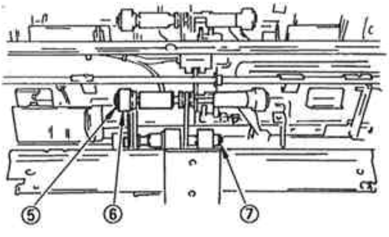


Figure 4-3016

6) Pull out the feeding roller ⑨ from the shaft together with the belt and pick-up roller shaft ⑧.

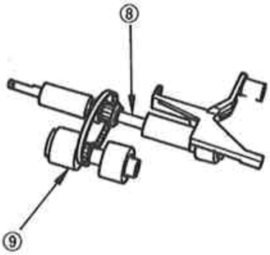


Figure 4-3017

Caution:
Take extra care when detaching the pick-up roller shaft: sensors are installed to some shafts.

Caution:
When attaching the feeding roller ①, make sure that the gear ② installed to the feeding roller is toward the copier's rear.

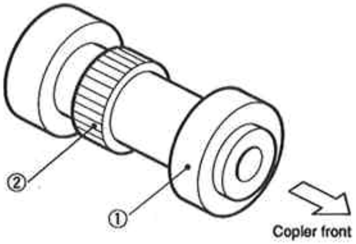


Figure 4-3018

8. Detaching the Cassette 1 Pick-Up Assembly Separation Roller

1) Remove the cassette 1 pick-up assembly.
2) Remove the screw ①, and remove the pick-up assembly support plate ②.

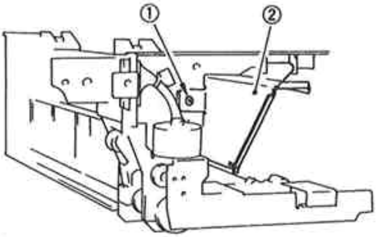


Figure 4-3019

3) Remove the screw ③, and remove the lower guide ④.

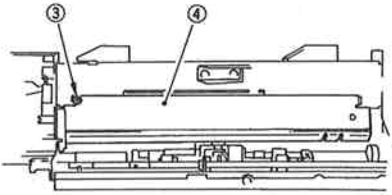


Figure 4-3020

4) Remove the two screws ⑥, and remove the separation roller unit ⑤.

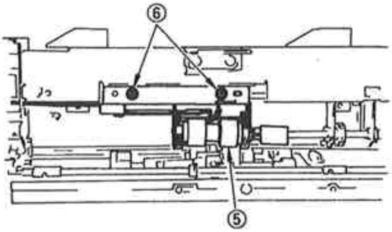


Figure 4-3021

5) Remove the E-ring ⑦ (made of resin).
6) Pull out the separation roller shaft ⑧, and remove the separation roller ⑨.

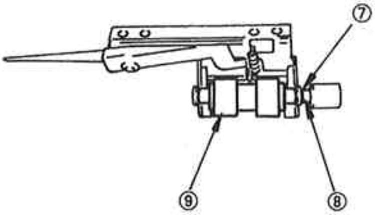


Figure 4-3022

Caution:
When attaching the separation roller ① to the pick-up assembly, make sure that the D-shaped cut is toward the copier's front.

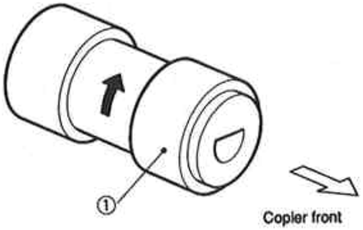


Figure 4-3023

9. Detaching the Cassette 2/3/4 Pick-Up Assembly Separation Roller

1) Remove the cassette 2/3/4 pick-up assembly.
2) Remove the screw ②, and remove the lower guide ①.

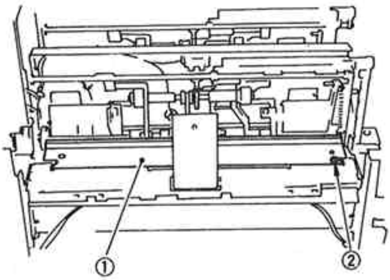


Figure 4-3024

3) Remove the two screws ④, and remove the separation roller unit ③.

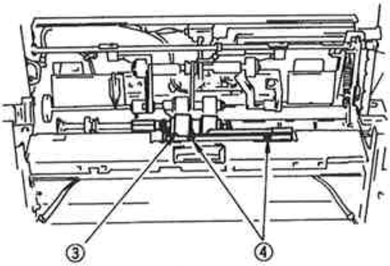


Figure 4-3025

4) Remove the two E-rings ⑤ (made of resin) .
5) Pull out the separation roller shaft ⑥, and remove the separation roller ⑦.

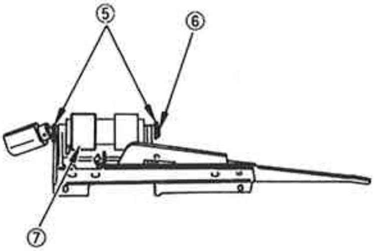


Figure 4-3026

10. Adjusting the Separation Roller Pressure

1) Remove the cassette 1/2/3/4 pick-up assembly.
2) Remove the screw ②, and remove the lower guide ①. (For the cassette 1 pick-up assembly, remove the pick-up assembly support plate first.)

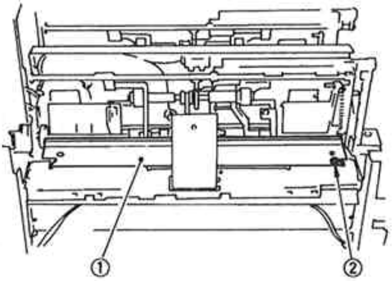


Figure 4-3027

3) If double-feeding or pick-up failure occurs during pick-up operation, adjust the position of the pressure spring ④ of the separation roller ③. If double-feeding occurs, move the hook of the spring to A. If pick-up failure occurs, move the hook of the spring to B.

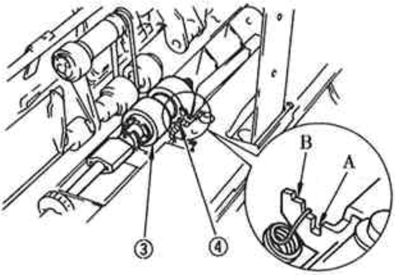


Figure 4-3028

11. Cassette 1/2/3/4/ Pick-Up Assembly Pick-Up Roller Releasing Solenoid

Keep the following in mind when attaching the solenoids (SL16, SL17, SL18, SL19).

While lifting the lever at the rear of the pick-up assembly, install the solenoid so that the pick-up roller arm ① butts against the upper stay ② when the plunger of the solenoid is forced in; see Figure 4-3028.

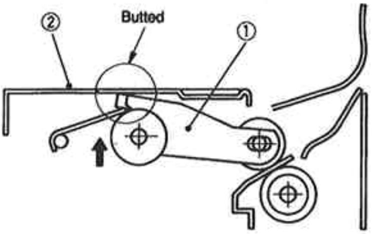


Figure 4-3029

12. Releasing the Lifter

If the lifter ① has moved up, push down the lifter releasing arm ② to move it down.

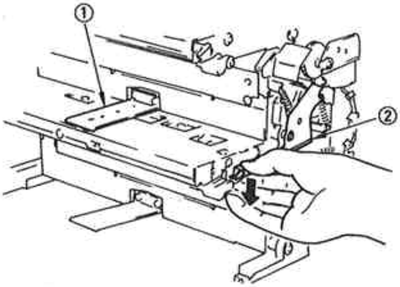


Figure 4-3030

13. Adjusting the Horizontal Registration of the Cassette

1) Remove the cassette from the holder you want to adjust.
2) Turn the adjusting screw ① to adjust the horizontal registration plate so that the horizontal registration on the copy image is 2 ±1 mm.

   To increase the registration at the front,

   ↓

   Turn the adjusting screw counterclockwise (a single turn will lead to a change of about 0.7 mm).

   To increase the registration at the rear,

   ↓

   Turn the adjusting screw clockwise (a single turn will lead to a change of about 0.7 mm).

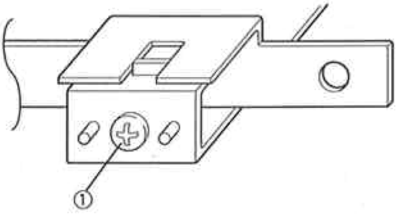


Figure 4-3031

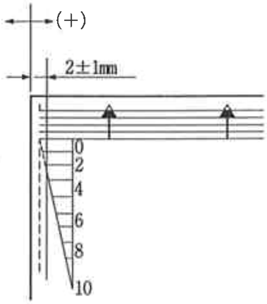


Figure 4-3032

B. Multifeeder Assembly

1. Detaching the Multifeeder Assembly

1) Remove the pick-up assembly.
2) Remove the reader controller PCB cover, multifeeder cover, upper right cover, and center right cover.
3) Disconnect the connector ①, and remove the four screws ②; then, open the pick-up assembly door, and remove the multifeeder assembly.

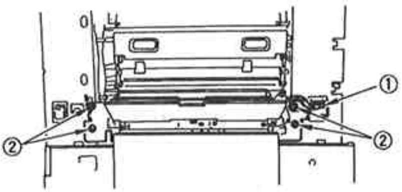


Figure 4-3033

2. Detaching the Multifeeder Pick-Up Roller

1) Remove the E-ring ① (made of resin), and carefully pull out the pick-up roller ②.

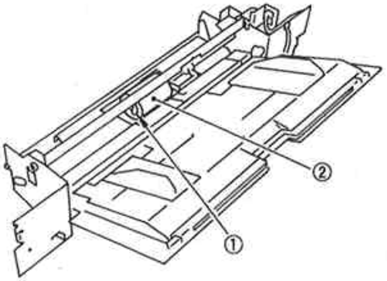


Figure 4-3034

Caution:

The pick-up roller is fixed to the shaft with a parallel pin; take extra care not to drop it when detaching and attaching the roller.

Reference:

When attaching the multifeeder pick-up roller ①, make sure that the side of the collar with a cross ② is toward the copier's rear.

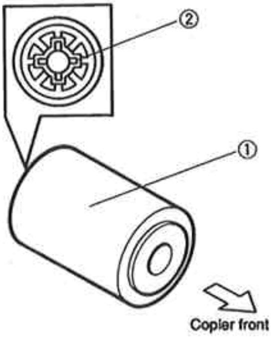


Figure 4-3035

3. Detaching the Separation Pad

1) Remove the multifeeder assembly.
2) Remove the screw ①, and remove the separation pad assembly ②.

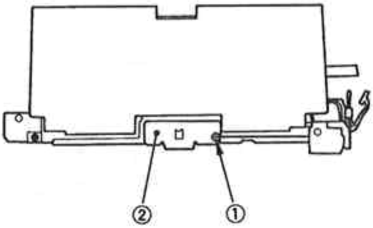


Figure 4-3036

Caution:

Manual Feed Separation Pad

If you have replaced the manual feed separation pad or the manual feed pick-up assembly, you must execute 'aging' in service mode.

(The pad found inside the machine has already been *aged* before shipment to ensure stable pick-up performance.)

Step

1) Make sure no copy paper is found in the manual feed assembly.
2) Activate service mode, and select 'FUNC' and then 'FMISC'.
3) Select 'MF-PAD'.
- The manual feed pick-up roller rotates about 10 min and then stops.
4) Press the Reset key. (The work is finished when you leave service mode.)

4. Adjusting the Separation Pad Pressure

Adjust the position of the pressure spring of the separation pad if double-feeding or pick-up failure occurs during pick-up operation.

① If double-feeding occurs, move the spring holder in the direction of A, thereby increasing the spring tension.

② If pick-up failure occurs, move the spring holder in the direction of B, thereby decreasing the spring tension.

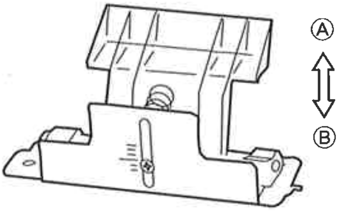


Figure 4-3037

5. Left/Right Registration

If the left/right registration is wrong when feeding from the multifeeder, loosen the screw ① to adjust the position of the tray.

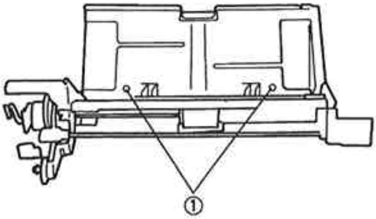


Figure 4-3038

6. Position of the Multifeeder Assembly Paper Guide Cam

Adjust the engagement and the control ring position of the 26T gear 1 and 26T gear 2 so that the paper guide plate and paper guide plate cam are positioned as shown in Figure 4-3039 when the solenoid plate is in contact with the claw of the control ring.

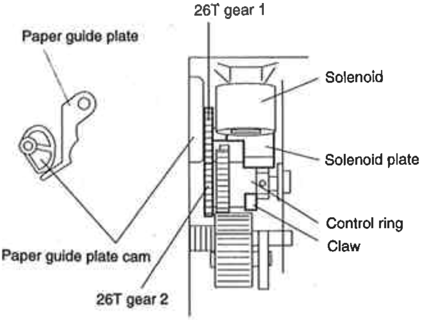

26T gear 1
Paper guide plate
Solenoid
Solenoid plate
Control ring
Claw
Paper guide plate cam
26T gear 2

Figure 4-3039

7. Attaching the Timing Belt of the Multifeeder Assembly

Butt the rack plate of the multifeeder fully against A, i.e., in open position.

Move the slide volume into the direction of B, and install the timing belt to the pulley.

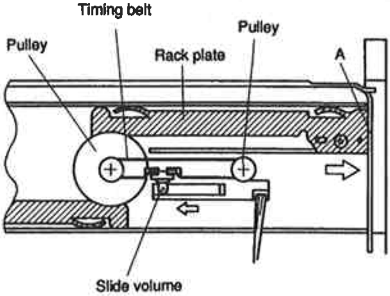

Timing belt
Pulley
Pulley
Rack plate
A
Slide volume

Figure 4-3040

C. No. 1 Feeding Assembly

1. Construction

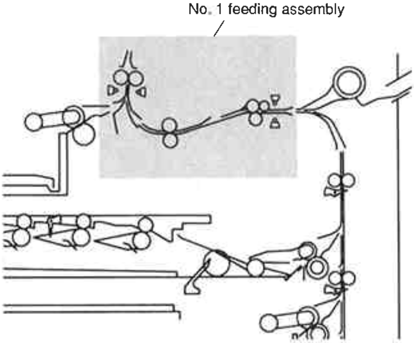


Figure 4-3041

2. Detaching the No. 1 Feeding Assembly

1) Pull out the transfer assembly frame.
2) Disconnect the two connectors ①, and remove the screw ②.

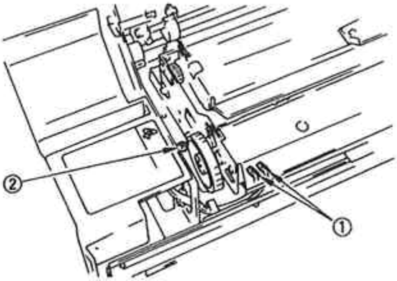


Figure 4-3042

3) Remove the No.1 feeding assembly while sliding it slightly to the front.

3. Replacing the Multifeeder Sensor (PS8)

1) Slide out the transfer assembly frame, and remove the screw ①; then, remove the lower hook of the transfer assembly lower right cover.

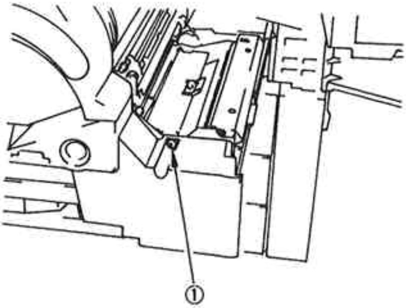


Figure 4-3043

2) Remove the screw ②, and remove the roller cover ③.

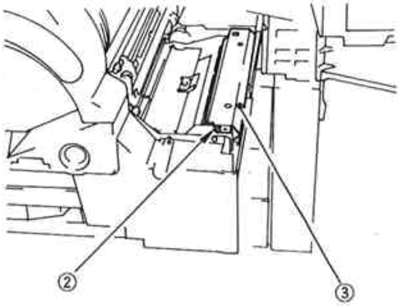


Figure 4-3044

3) Disconnect the connector ④, and remove the screw ⑤; then, remove the multifeeder sensor (PS8) ⑥.

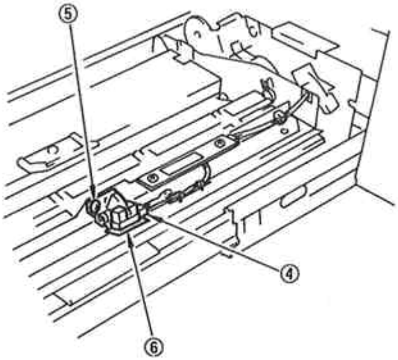


Figure 4-3045

4. Replacing the Light-Emitting Assembly PCB of the OHP Sensor (PS40)

1) Pull out the transfer assembly frame, and remove the screw ①; then, remove the lower hook of the transfer assembly lower right cover.

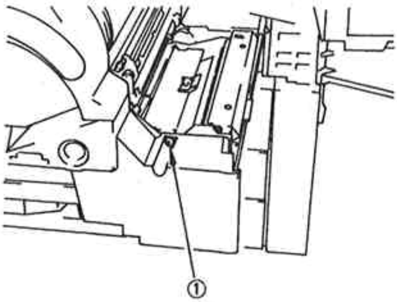


Figure 4-3046

2) Remove the screw ②, and remove the roller cover ③.

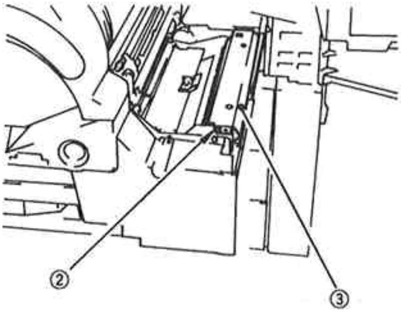


Figure 4-3047

3) Disconnect the connector ④, and remove the two screws ⑤; then, remove the light-emitting assembly PCB ⑥ of the OHP sensor (PS40).

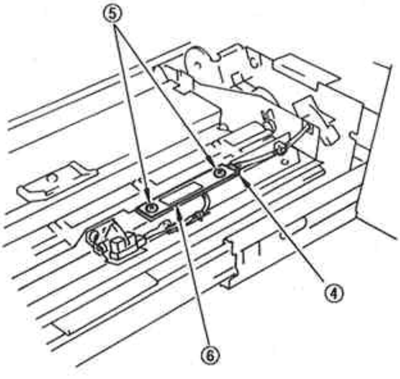


Figure 4-3048

5. Replacing the Light-Receiving PCB of the OHP Sensor (PS40)

1) Slide out the transfer frame.
2) Disconnect the connector ①, and remove the screw ②; then, remove the light-receiving assembly PCB ③ of the OHP sensor (PS40).

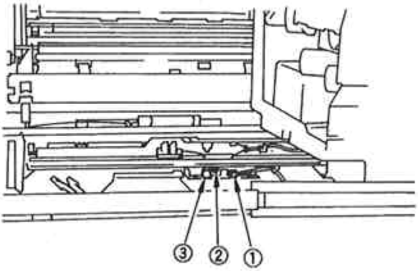


Figure 4-3049

6. Detaching the Pre-Registration Feeding Clutch (CL10)

1) Remove the No. 1 feeding assembly.
2) Remove the screw ①, and remove the roller cover ②.

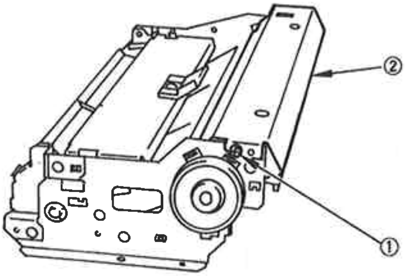


Figure 4-3050

3) Disconnect the connector ③, and remove the grip ring ④; then, remove the pre-registration feeding clutch (CL10) ⑤.

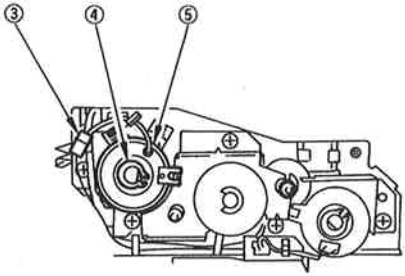


Figure 4-3051

7. Detaching the Manual Feed Feeding Clutch (CL11)

1) Remove the No. 1 feeding assembly.
2) Remove the screw ①, and remove the roller cover ②.

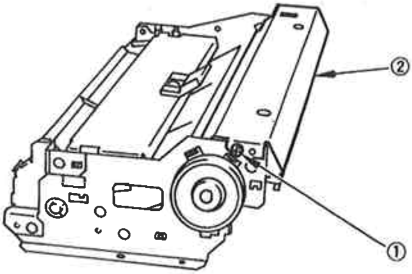


Figure 4-3052

3) Disconnect the connector ③, and remove the grip ring ④; then, remove the manual feed feeding clutch (CL11) ⑤.

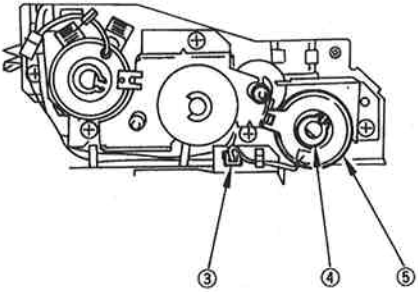


Figure 4-3053

8. Detaching the Retention Push-On Roller Unit

1) Slide out the transfer frame, and remove the transfer cover and transfer frame cover.
2) Remove the screw ① and the registration roller assembly fixing pin ②.

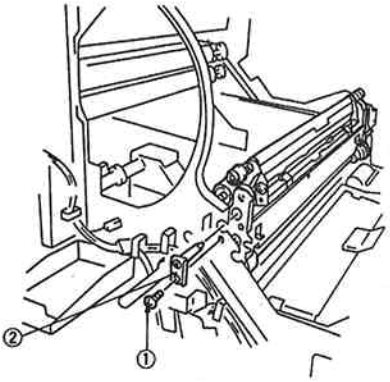


Figure 4-3054

3) Remove the screw ③, and remove the rear plate ④.

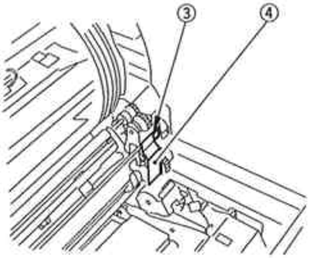


Figure 4-3055

4) Remove the retention push-on roller unit as shown in Figure 4-3056.

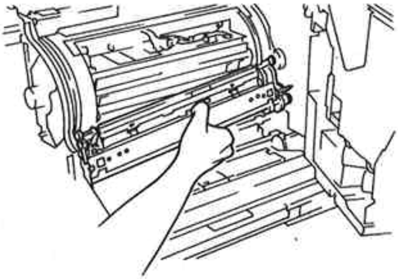


Figure 4-3056

Caution:
Take care so that the retention push-on roller unit or fingers will not come into contact with the transfer sheet.

9. Detaching the Retention Smoothing Roller

1) Remove the retention smoothing roller unit.
2) Remove the E-ring ①, and remove the retention smoothing roller ②.

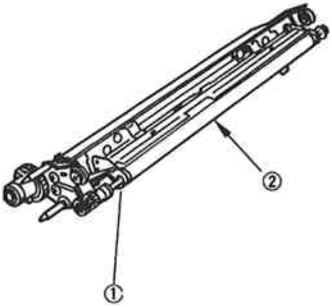


Figure 4-3057

10. Detaching the Scraper Unit of the Retention Smoothing Roller

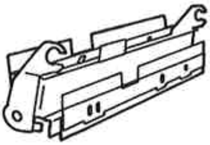


Figure 4-3058

1) Remove the retention push-on roller unit.
2) Remove the retention smoothing roller ①, and remove the two screws ②; then, remove the scraper unit ③.

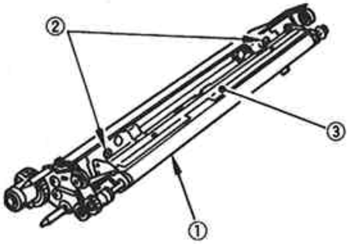


Figure 4-3059

11. Removing the Scrapers 1, 2, and 3 of the Retention Smoothing Roller

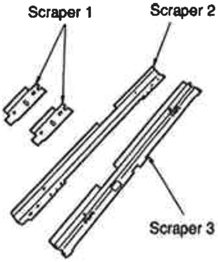


Figure 4-3060

a. Removing the Scrapers 1 and 3

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the spring ①, and remove the scraper 1 and 2 units. (TYPE 1)

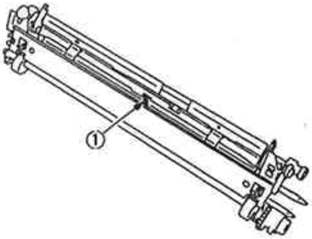


Figure 4-3061

Remove the scraper 1 and 3 units. (TYPE 2)

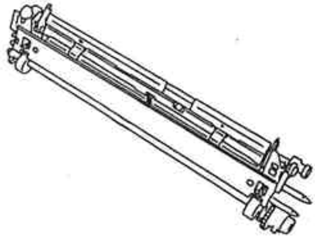


Figure 4-3062

3) Remove the two screws ②, and remove the scrapers 1 and 3. (Keep in mind that the scraper 1 consists of two pieces; see the steps on how to remove the scraper 1.)

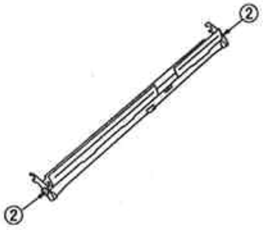


Figure 4-3063

b. Removing the Scraper 2

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the scraper 1 and 3 units.
3) Remove the two screws ③, and remove the scraper 2 ④.

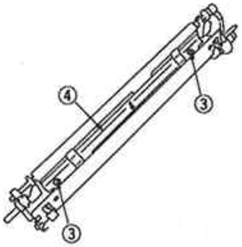


Figure 4-3064

c. Removing the Scraper 1

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the scraper 1 and 3 units.
3) Remove the two screws, and remove the scraper 2.
4) Remove the screw ⑤, and remove the scraper 1 ⑥.

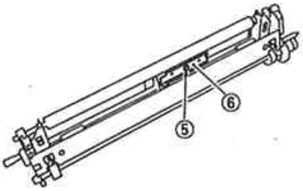


Figure 4-3065

12. Removing the Retention Smoothing Roller Guide Sheet

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the screw ①, and remove the guide sheet ②.

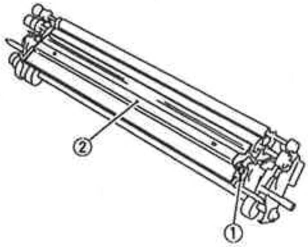


Figure 4-3066

13. Detaching the Registration Clutch (CL9)

1) Put down the transfer drum, fixing assembly, and transfer assembly frame.
2) Remove the retention push-on roller unit.
3) Disconnect the connector ①, and remove the screw ② and grip ring ③; then, remove the registration clutch (CL9).

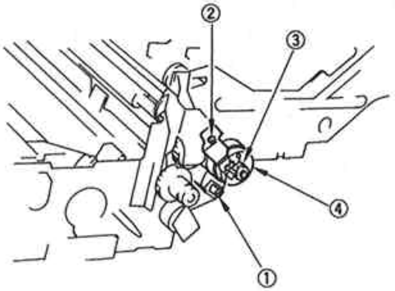


Figure 4-3067

14. Detaching the Registration Roller

1) Remove the registration clutch.
2) Remove the two screws ① and E-ring ②; then, remove the retention roller drive gear unit ③.

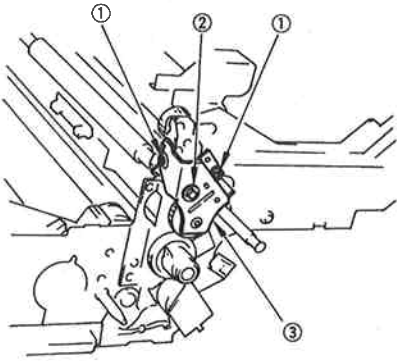


Figure 4-3068

3-1) Remove the roller pressure spring (rear) ④.

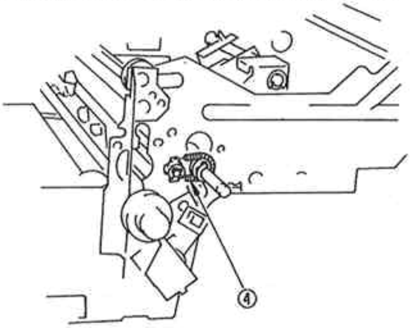


Figure 4-3069

3-2) Remove the three E-rings ⑥ ⑦ from the registration metal roller ⑤.

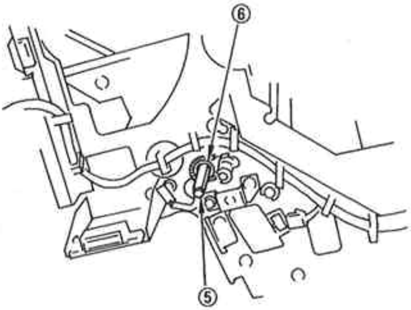


Figure 4-3070 (front)

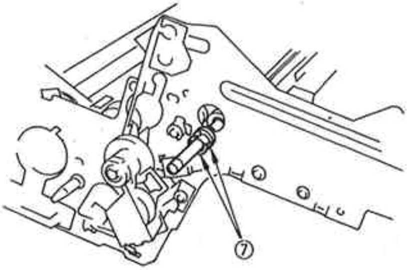


Figure 4-3071 (rear)

4) Pull out the registration metal roller ⑤ as shown in Figure 4-3072.

Caution:
The OHP sensor is found under the registration metal roller; take care not to bring the roller in contact with the sensor.

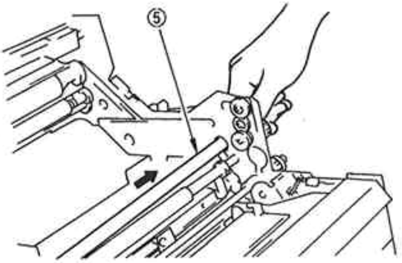


Figure 4-3072

5) Remove the E-ring ⑥ and washer ⑦; then, pull out the bushing ⑧.

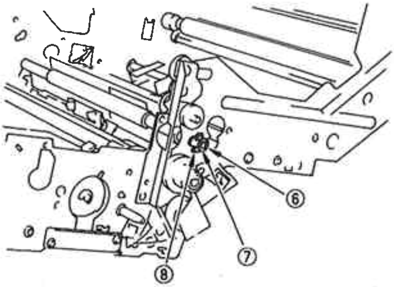


Figure 4-3073

6) While holding the releasing lever ⑨ with one hand, move the roller shaft ⑩ to the right (arrow direction) and pull it off toward the front.

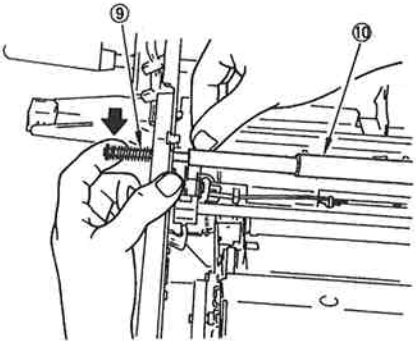


Figure 4-3074

7) Remove the E-ring ⑪ and two washers ⑫, and remove the spring ⑬.

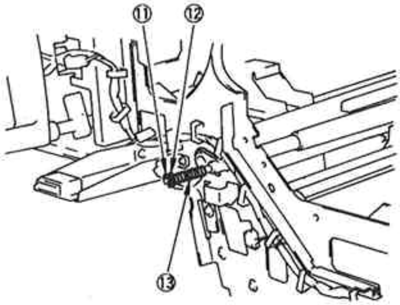


Figure 4-3075

8) Remove the roller pressure spring (front) ⑭.

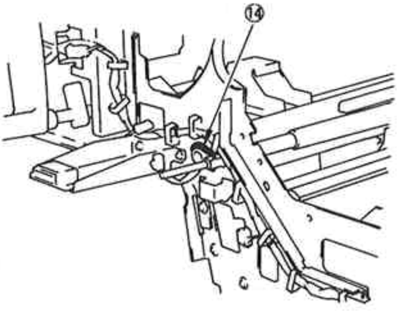


Figure 4-3076

9) Pull out the registration rubber roller ⑮ as shown in Figure 4-3077.

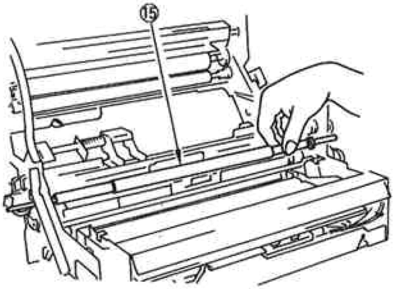


Figure 4-3077

15. Detaching the Registration Releasing Solenoid (SL9)

1) Put down the transfer drum, fixing assembly, and transfer assembly frame.
2) Remove the No. 1 feeding assembly.
3) Disconnect the connector ①, and remove the screw ②; then, remove the registration pressure solenoid ③.

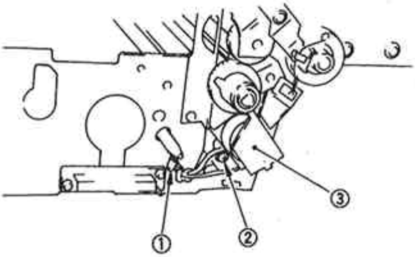


Figure 4-3078

D. No. 2 Feeding Assembly

1-1. Detaching the Feeding Belt (TYPE 1)

1) Pull out the transfer assembly frame, and put down the fixing assembly.
2) Remove the screw ①, and remove the feeding belt unit ②.

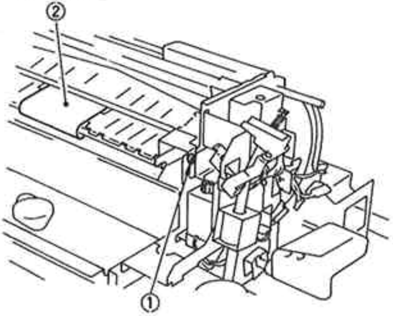


Figure 4-3079

3) Remove the four screws ③, and pull out the guide plate ④.

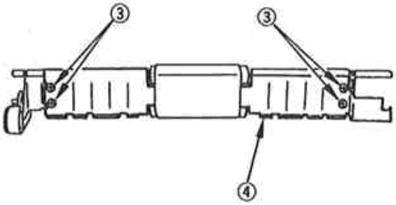


Figure 4-3080

4) Remove the feeding belt drive roller ⑤, and remove the feeding belt ⑥.

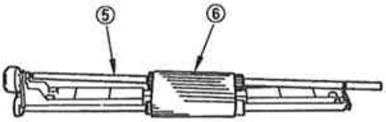


Figure 4-3081

1-2. Removing the Feeding Belt (TYPE 2)

1) Draw out the transfer assembly frame, and take out the fixing assembly.
2) Remove the screw, and take out the feeding belt unit.
3) Remove the E-ring ①, and remove the feeding belt drive roller ②.
4) Remove the feeding belt ③.

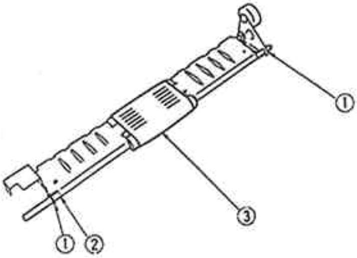


Figure 4-3082

E. Transfer Drum Assembly

1. Construction

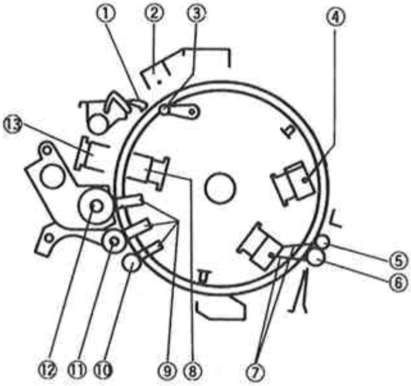


Figure 4-3083

① Separation claw
② Separation corona assembly
③ Separation push-up spacer
④ Transfer brush
⑤ Retention smoothing roller
⑥ Retention roller
⑦ Retention brush
⑧ Internal static eliminator
⑨ Transfer push-on brush
⑩ Transfer polishing roller
⑪ Transfer oil removing roller
⑫ Transfer drum cleaner
⑬ External static eliminator

2. Detaching the Retention/Retention Smoothing Brush

1) Shift the pressure lever to the right to release.
2) Remove the screw ①, and pull out the retention/retention smoothing brush.

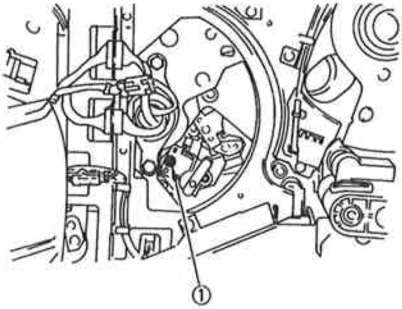


Figure 4-3084

3. Detaching the Transfer Brush

1) Shift the pressure lever to the right to release.
2) Remove the screw ①, and pull out the transfer brush.

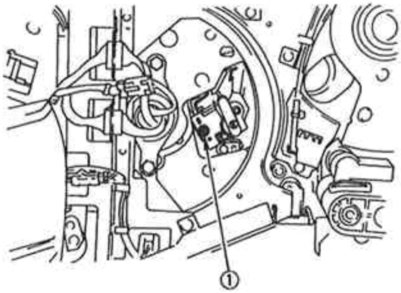


Figure 4-3085

4. Detaching the External Static Eliminator

1) Remove the screw ①, and pull out the external static eliminator ②.

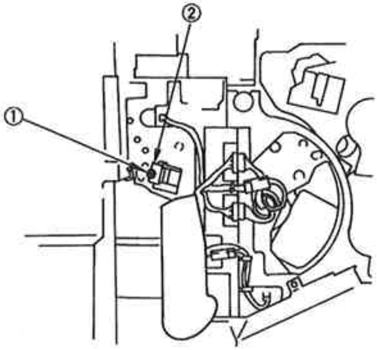


Figure 4-3086

5. Detaching the Transfer Drum

Caution:
The one-way clutch is in its active position when the transfer drum is on the transfer assembly frame; do not turn the transfer drum with your fingers inside the transfer drum.
Moreover, do not turn it when the transfer drum is off the transfer assembly frame; the transfer drum would rotate in reverse, damaging the transfer brush or retention brush.
You must make the following adjustments in service mode (FUNC, ATTRACT) whenever you have replaced the transfer drum:
1 retention position (ATT-TA, ATT-TB)
2 image leading edge margin (RG-XA, RG-XB, RG-Y)
3 transfer delay (TR-DELAY)

1) Open the hopper, and remove the transfer frame cover; then, pull out the transfer frame.
2) Disconnect the connector ① for the separation sensor, three connectors ② for the transfer drum, and the connector ③ for the polishing roller motor.

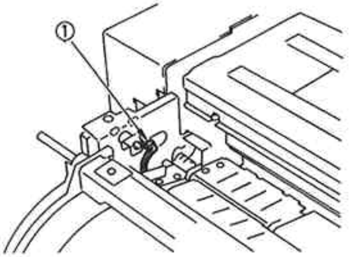


Figure 4-3087

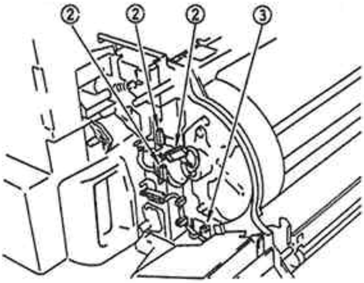


Figure 4-3088

3) Remove the two screws ④, and release the transfer assembly metal fixing.
4) Remove the two screws, and remove the grip.
5) Remove the screw ⑥, and remove the transfer assembly metal fixing ⑦ (binding screw); then, rotate the transfer frame metal fixing toward the front.

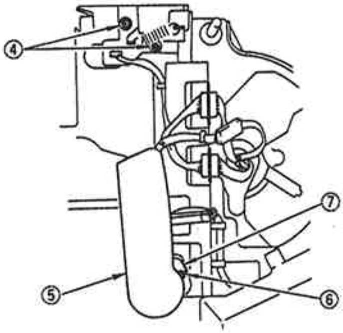


Figure 4-3089

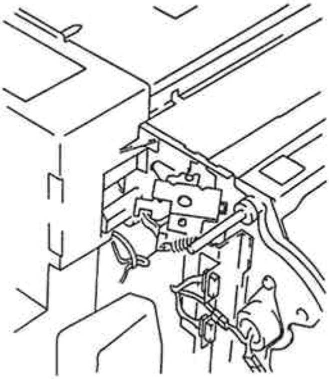


Figure 3-3090 (rotated)

6) Hold the rear of the transfer drum with one hand, and lift the transfer drum by holding its grip with the other hand.

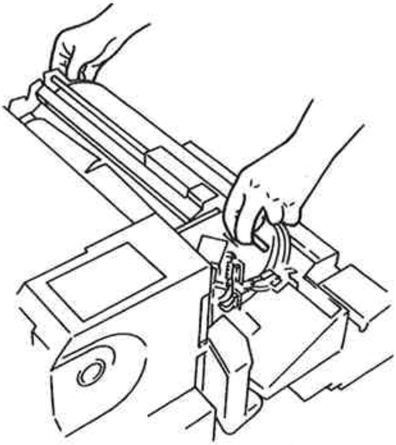


Figure 4-3091

Caution:
Take care not to bring the retention roller in contact with the transfer drum sheet.

7) Place the transfer drum as shown in Figure 4-3092.

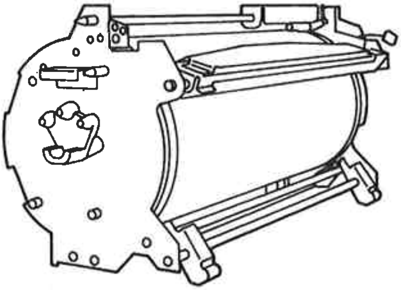


Figure 4-3092

6. Points to Note When Attaching the Transfer Drum

- After placing the transfer drum on the transfer assembly frame, check that it is seated as shown in Figure 4-3093.

Correct

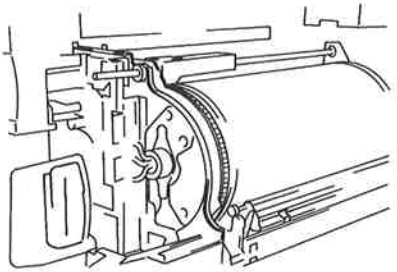


Figure 4-3093

Wrong

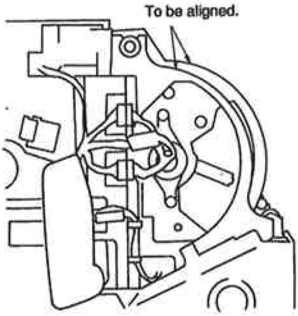


Figure 4-3094

7. Detaching the Internal Static Eliminator

1) Put down the transfer drum from the transfer assembly frame.
2) Rotate the transfer drum so that the hole in the rear plate of the transfer drum and the hole in the transfer drum are matched.
3) Remove the screw ①, and pull out the internal static eliminator ②.

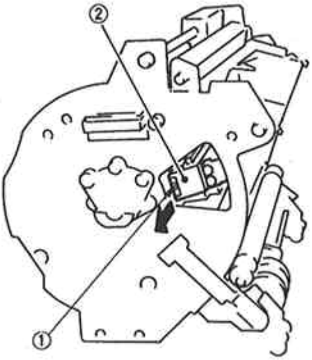


Figure 4-3095

8. Detaching the Separation Corona Assembly

1) Pull out the transfer assembly frame.
2) Remove the screw ①, and remove the separation corona assembly ②.

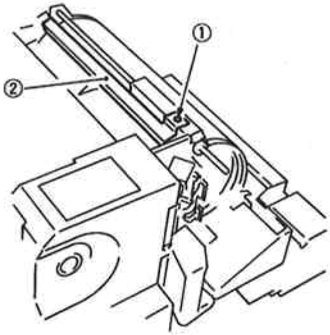


Figure 4-3096

9. Detaching the Separation Sensor

1) Pull out the transfer assembly frame.
2) Put down the transfer drum unit.
3) Remove the two screws ①, and remove the separation guide ②.

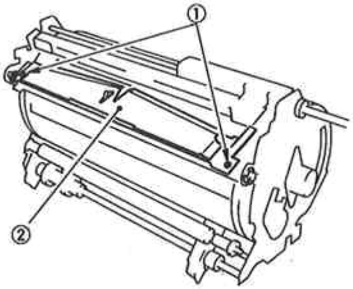


Figure 4-3097

4) Remove the two screws, and disconnect the connector; then, remove the sensor.

10. Removing the Separation Claw

1) Pull out the transfer frame.
2) Remove the two screws, and remove the separation guide. (See Figure 4-3097.)
3) Remove the screw, and remove the separation claw.

Caution:
If the separation claw assembly and the transfer drum assembly do not fit well after replacing the separation claw or if separation faults occur, adjust the position of the separation claw.

11. Replacing the Transfer Drum Sheet

a. Detaching the Transfer Drum Sheet

1) Open the front door, and slide out the hopper; then, open it 180°.
2) Pull out the transfer assembly frame.
3) Put down the transfer drum from the transfer assembly frame.
4) Remove the four screws ①, and remove the transfer drum side scraper ②.

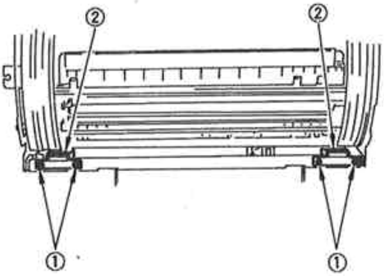


Figure 4-3098

5) Peel the trailing edge of the transfer drum sheet and keep the edge off the drum.

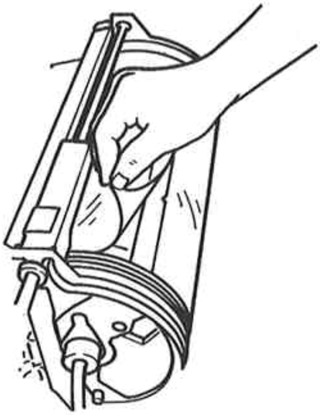


Figure 4-3099

6) Peel the leading edge of the transfer drum sheet.

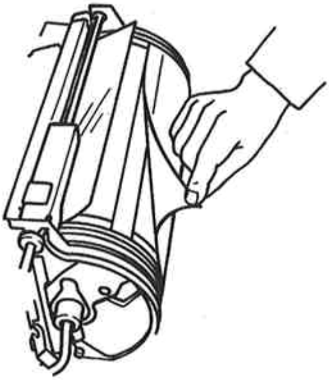


Figure 4-3100

7) Remove the transfer drum sheet by picking up its leading edge.

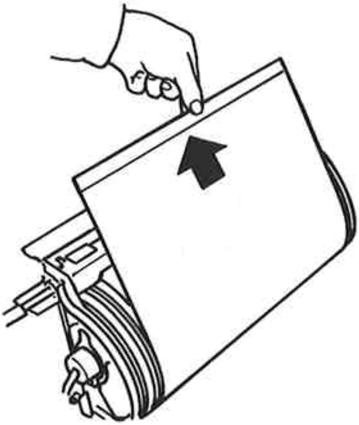


Figure 4-3101

Caution:
If adhesive remains on the ring of the transfer drum, be sure to remove it completely.

b. Attaching the Transfer Drum Sheet

Caution:
Do not touch the areas of the transfer drum sheet where copy paper will come into contact.

Reference:

1. Place copy paper (A3) on the transfer assembly frame to avoid damage to the transfer drum sheet.
2. Install the transfer drum sheet starting on the right side of the copier's front; starting from the front could place the sheet askew.

1) Clean the area of the transfer drum ring where tape will be used with alcohol.
2) Rotate the ring so that the ring connecting plate ③ is positioned as shown in Figure 4-3102.

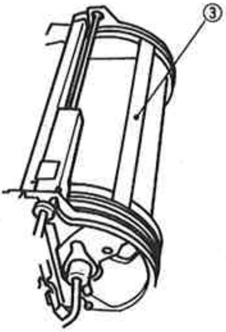


Figure 4-3102

3) Peel the adhesive tape from the leading edge of the transfer drum sheet, i.e., the end along which holes are made in the sheet.
4) Align the holes of the transfer drum sheet with the holes in the connecting plate, and install the leading edge.

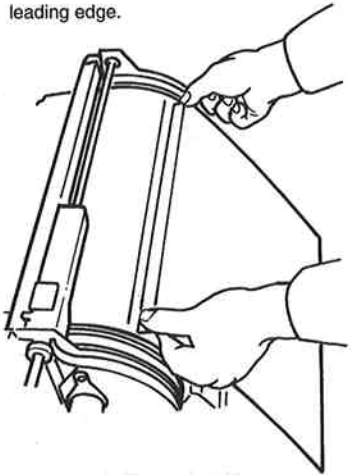


Figure 4-3103

5) Peel the adhesive tape for the transfer drum sheet.
6) Hold the trailing edge of the transfer drum sheet with one hand; let the sheet down on its own weight, and attach the sheet while turning the ring at the front of the transfer drum.

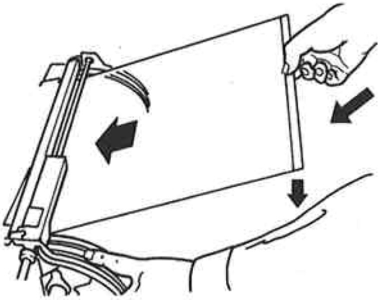


Figure 4-3104

Caution:
Make sure that the gap between the leading and trailing edges of the transfer drum sheet is 0 ±1.5 mm when attachment is complete.

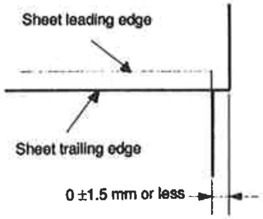

Sheet leading edge
Sheet trailing edge
0 ±1.5 mm or less

Figure 4-3105

7) While pressing the leading edge of the transfer drum sheet, install the sheet as if to tap it from its middle to its ends.

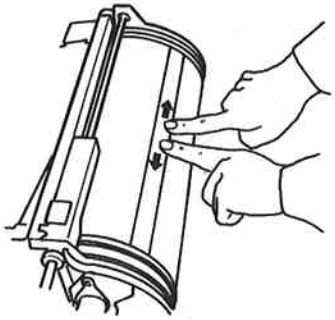


Figure 4-3106

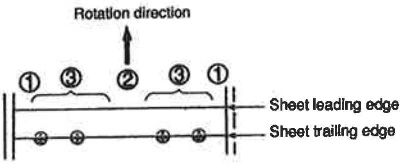

Rotation direction
① ③ ② ③ ①
Sheet leading edge
Sheet trailing edge

Figure 4-3107

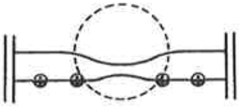


Figure 4-3108

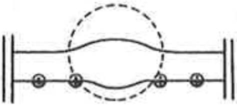


Figure 4-3109

Caution:
Make sure that the center of the transfer drum sheet is free of warps or slack.
A warp will cause the transfer drum sheet to come into contact with the photosensitive drum, in turn causing toner to fuse onto the photosensitive drum and triggering cleaning faults.
Slack, on the other hand, can trigger transfer faults or color displacement.

8) Run fingers along the adhesive tape on the transfer drum sheet once again to ensure proper adhesion.
9) Check the transfer drum for scratches, dents, and slack.
10) Slide the transfer frame into the copier.
11) Turn on the copier, and execute the following:
- Activate service mode, and select 'TCLN' under 'FUNC'.
- Press 'KCLN'.
- Make sure that the transfer drum and the polishing roller rotate and the indication <P> on the control panel display change from 'READY' to 'SERVICE' (about 3 min 30 sec), and then to 'READY'.
- The above operations complete the session.

Caution:
If you have replaced the transfer sheet or the transfer drum unit in the field, have the machine polish the surface of the transfer sheet using service mode. (The transfer sheet that comes with the machine have been polished before shipment; you will find fine lines on the sheet left by the operation.)
Executing the polishing operation will serve to prevent adhesion of silicone oil from the 1st side of a two-sided copy to the surface of the transfer sheet when making two-sided copies either in auto or manual mode.
Steps
1) Activate service mode.
2) Select 'FUNC' and then 'TCLN'.
3) Select 'KCLN'.
- The polishing roller will rotate for about 4 min and will stop automatically.
4) Press the Reset key; the work is ended when you leave service mode.

12. Detaching the Separation Push-Up Solenoid

1) Slide out the transfer frame, and remove the transfer drum.
2) Remove the four screws ①, and remove the two transfer sheet scrapers ②.

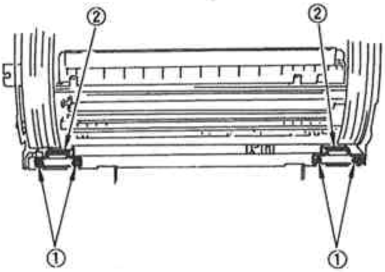


Figure 4-3110

3) Peel the transfer sheet.
4) Disconnect the connector ③, and remove the spring ④.

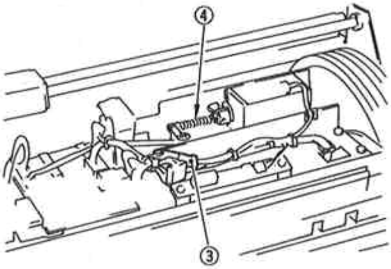


Figure 4-3111

5) Remove the E-ring ⑤ from the transfer drum front plate.

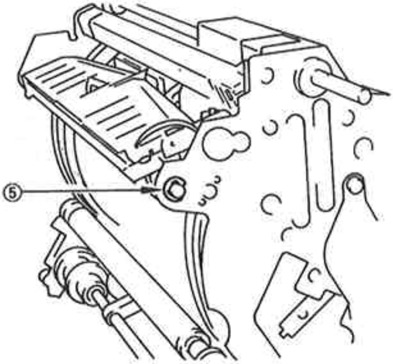


Figure 4-3112

6) Remove the E-ring ⑥ from the transfer drum rear plate, and remove the separation claw unit.

Caution:
Take note of the separation claw unit.

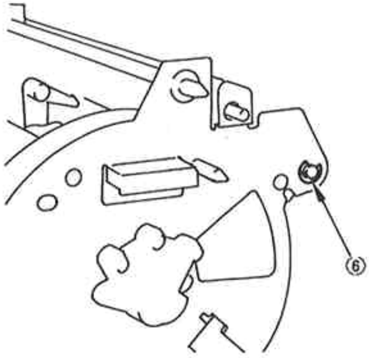


Figure 4-3113

7) Remove the two screws ⑦, and remove the separation push-up solenoid ⑧.

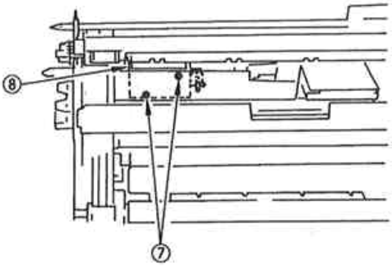


Figure 4-3114

13. Detaching the Brush Drive Motor (M11)

1) Slide out the transfer assembly frame, and remove the transfer drum.
2) Remove the four screws ①, and remove the two transfer sheet scrapers ②.

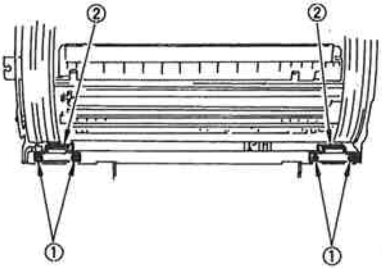


Figure 4-3115

3) Remove the transfer sheet.
4) Disconnect the connector ③, and remove the two screws ④; then, remove the brush drive motor.

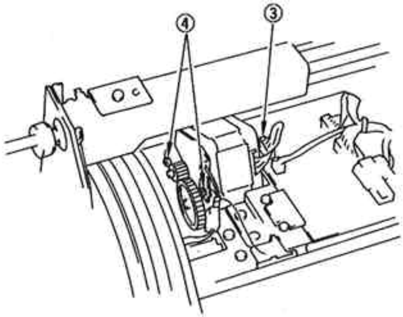


Figure 4-3116

14. Detaching the Brush Drive Motor Home Position Sensor

1) Remove the transfer drum.
2) Remove the transfer sheet.
3) Disconnect the connector ①, and remove the screw ②; then, remove the brush drive motor home position sensor ③.

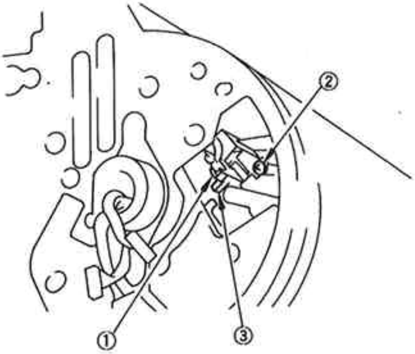


Figure 4-3117

15. Detaching the Transfer Drive PCB

1) Slide out the transfer assembly frame, and remove the transfer drum.
2) Remove the four screws, and remove the two transfer sheet scrapers.
3) Remove the transfer sheet.
4) Disconnect the six connectors ①, and remove the five screws ②; then, remove the transfer driver PCB.

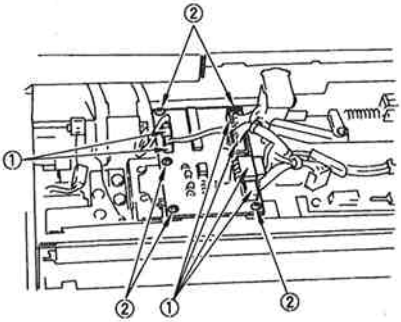


Figure 4-3118

16. Detaching the Side A Sensor

1) Slide out the transfer assembly frame, and put down the transfer drum.
2) Remove the four screws, and remove the two transfer sheet scrapers.
3) Remove the transfer sheet.
4) Disconnect the connector ①, and disengage the clip from behind the sensor mount; then, remove the A side sensor ②.

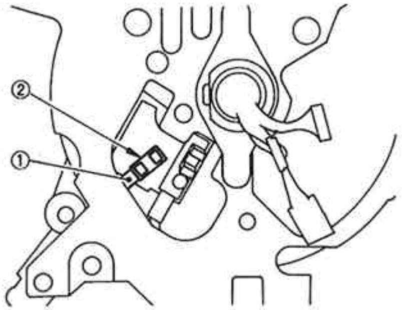


Figure 4-3119

17. Detaching the B Side Sensor

1) Slide out the transfer assembly frame, and put down the transfer drum.
2) Disconnect the connector ①, and remove the screw ②; then, remove the B side sensor ③.

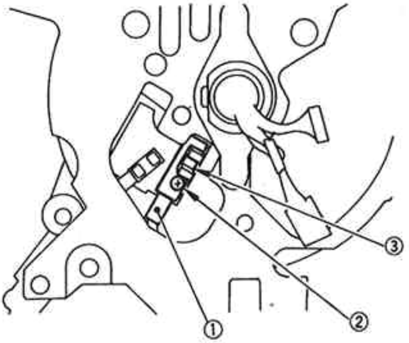


Figure 4-3120

18. Detaching the Separation Push-Up Spacer

1) Slide out the transfer assembly frame, and put down the transfer drum.
2) Remove the four screws, and remove the two transfer sheet scrapers.
3) Remove the transfer sheet.
4) Remove the separation push-up spacer ①.

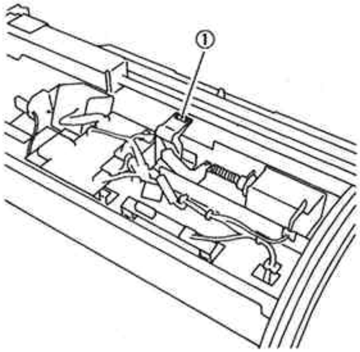


Figure 4-3121

F. Transfer Assembly Frame

1. Detaching the Transfer Assembly Frame

1) Pull out the transfer assembly frame.
2) Put down the fixing assembly.
3) Put down the transfer drum.
4) Take out the transfer frame by holding its grips.

Caution:
The transfer assembly frame weighs about 10 kg; take care when moving it.

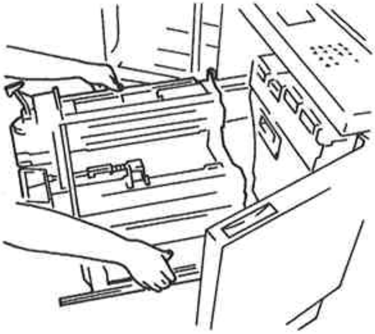


Figure 4-3122

2. Detaching the Registration Roller Assembly

1) Pull out the transfer assembly frame.
2) Remove the screw ① and the registration roller assembly fixing pin ②.

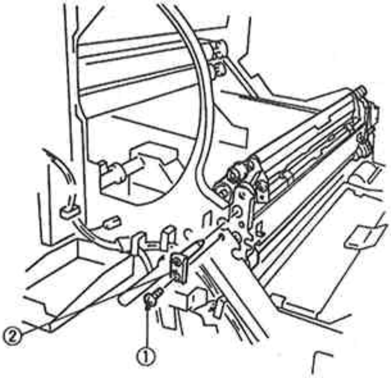


Figure 4-3123

3) Remove the registration roller assembly.

Caution:
1. Take care not to bring the gears and the like of the registration roller assembly into contact with the transfer sheet.
2. Do not hold the roller assembly or scraper assembly with fingers or the like.

G. Delivery Assembly

1. Detaching the Delivery Assembly

1) Remove the upper left cover.
2) Remove the delivery assembly upper cover.
3) Remove the four screws ①, and disconnect the two connectors ②.

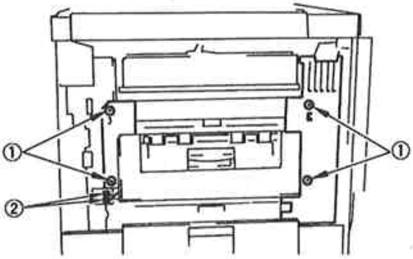


Figure 4-3124

4) Slide out the delivery assembly with care.

2. Positioning the Delivery Assembly Paper Deflector Drive Solenoid (SL20)

1) Remove the delivery assembly.
2) Place the delivery assembly on a level surface.
3) Keep the paper deflecting plate ② so that it butts against the delivery assembly upper guide ③ while viewing the delivery assembly from its side (rear) when the solenoid ① is on; then, loosen the adjusting screw ④ to make adjustments.

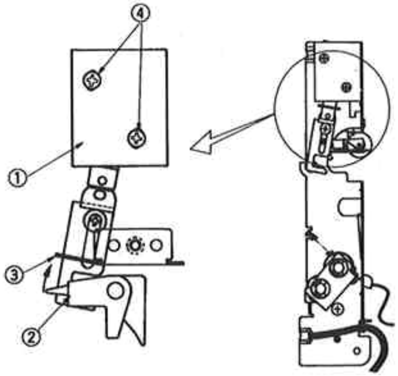


Figure 4-3125

H. Duplexing Reversing Assembly

1. Detaching the Duplexing Reversing Assembly

1) Remove the upper left cover.
2) Remove the lower left cover.
3) Slide out the duplexing unit.
4) Remove the six screws ①, and disconnect the three connectors ②.

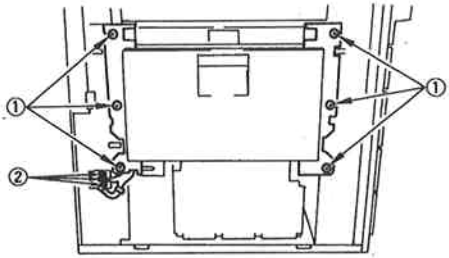


Figure 4-3126

5) Slide the reversing unit slowly to remove.

2. Detaching the Duplexing Reversing Assembly Switch-Back Motor (M17)

1) Remove the duplexing reversing assembly.
2) Open the duplexing reversing assembly door.
3) Remove the two screws ①.

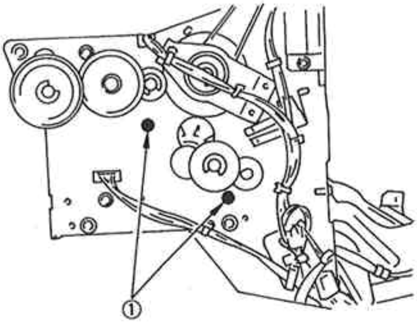


Figure 4-3127

4) Disconnect the connector ②, and hold the duplexing reversing assembly switch-back motor ③; then, disengage the gear, and remove the motor.

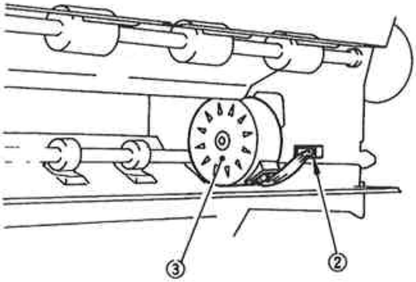


Figure 4-3128

3. Detaching the Duplexing Drive Clutch (CL22)

1) Remove the duplexing reversing assembly.
2) Disconnect the connector ①, and remove the screw ②.
3) Remove the C-ring ③.
4) Loosen the hex screw ④, and remove the duplexing drive clutch.

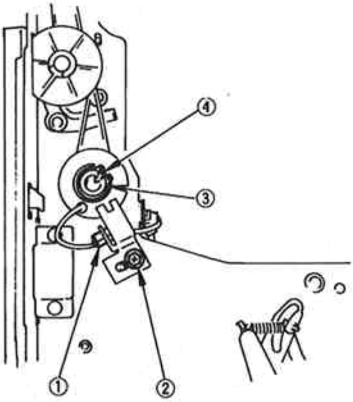


Figure 4-3129

4. Detaching the Duplexing Reversing Clutch (CL23)

1) Remove the rear cover.
2) Remove the screw, and open the DC controller PCB.
3) Remove the drive belt ① as shown in Figure 4-3130.

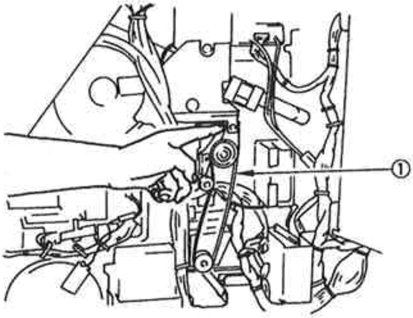


Figure 4-3130

4) Remove the three screws ②, and remove the gear cover.

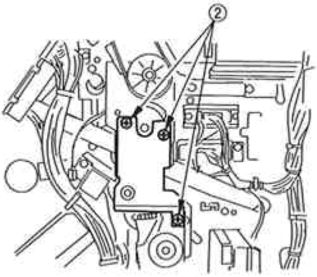


Figure 4-3131

5) Disconnect the connector ③, and remove the two screws ④; then, shift the duplexing reversing clutch unit ⑤ to the right to remove.

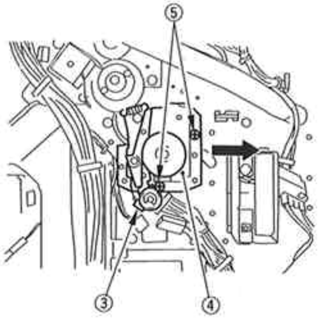


Figure 4-3132

6) Remove the two screws ⑤ of the duplexing reversing clutch unit; then, remove the clutch cover ⑥.

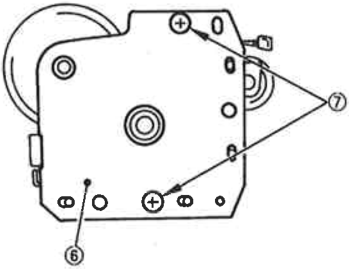


Figure 4-3133

7) Remove the bearing ⑦, and remove the E-ring ⑧ and C-ring ⑨, and loosen the hex screw ⑩.

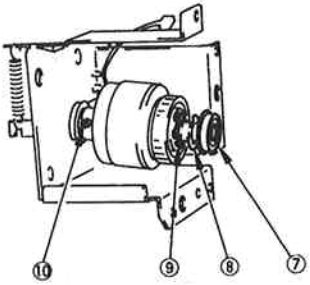


Figure 4-3134

8) Remove the duplexing reversing clutch.

IV. EXPOSURE SYSTEM

A. Scanning System

1. Removing the Scanning Lamp

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the three screws ①, and remove the anti-deflection plate ②.

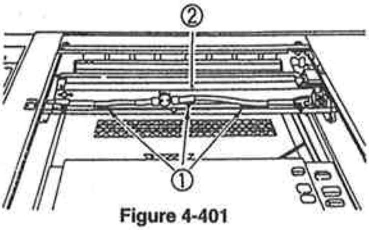


Figure 4-401

4) Turn a flat-blade screwdriver in the direction of the arrow ③ to open the electrode plate in the direction of the arrow ④ to remove the scanning lamp.

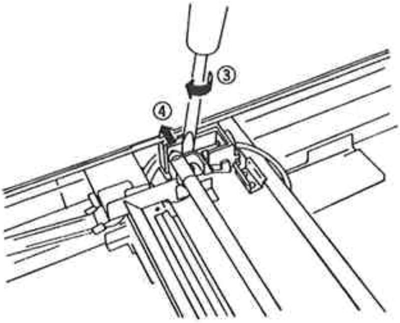


Figure 4-402

Caution:
1. Wait until the scanning lamp has cooled before starting the work.
2. Do not leave fingerprints on the scanning lamp.
3. If the surface of the scanning lamp is soiled, dry-wipe it.

2. Orientation of the Lamp

Hold the lamp so that the bump ① in the middle is in the direction of the arrow; lengthwise, put the lamp with the logo mark toward the rear.

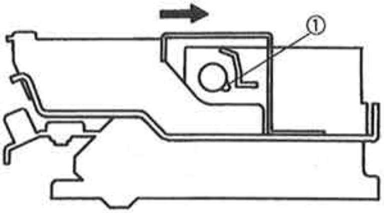


Figure 4-403

Caution:
Do not touch the lamp with your fingers when handling it.

3. Detaching the Standard White Plate

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the two screws ①, and remove the standard white cover ②.

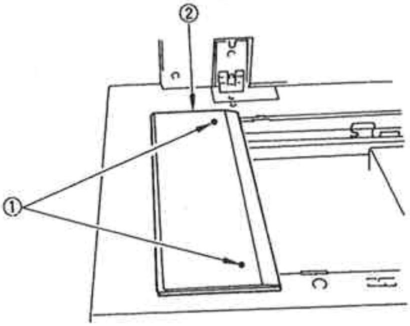


Figure 4-404

4) Remove the two screws ③, and remove the standard white plate ④.

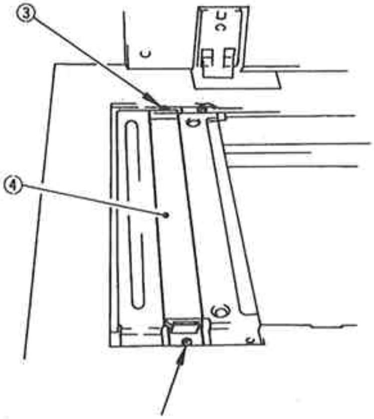


Figure 4-405

4. Detaching the Lens Mount Cover/ CCD Cover/CCD Unit

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the four screws, and remove the lens mount cover.

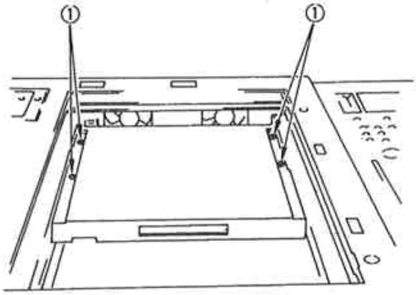


Figure 4-406

4) Remove the CCD cover ②.

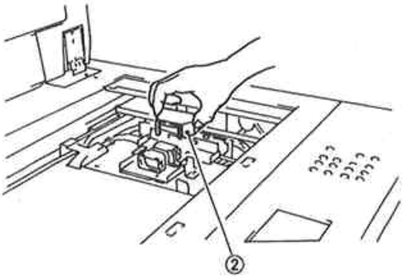


Figure 4-407

5) Remove the two screws ③, and remove the two CCD unit retaining springs ④.

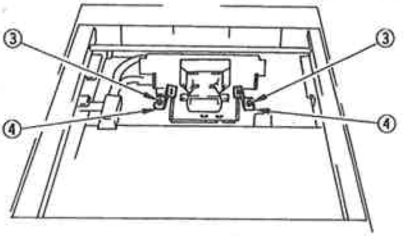


Figure 4-408

6) Lift the CCD unit, and disconnect the two connectors (J2001, J2003).

5. Detaching the Laser Scanner Cover

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the lens mount cover.
4) Remove the four screws ①, and remove the laser scanner cover ②.

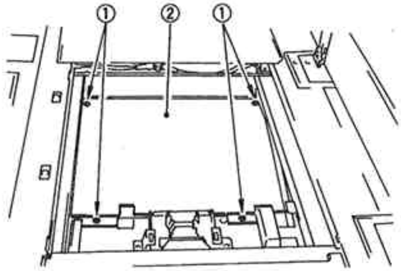


Figure 4-409

Caution:
Move the mirror mount fully to the left.
Take care not to damage the power line ③ of the scanning lamp.

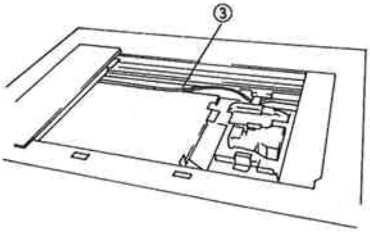


Figure 4-410

Cut-out at the Front
Remove in the direction of the arrow.

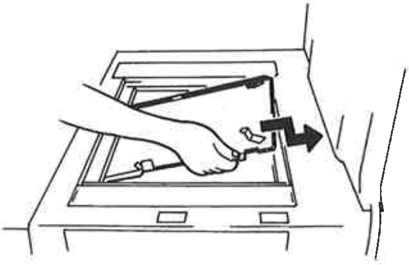


Figure 4-411

B. Pre-Exposure Lamp

1. Detaching the Pre-Exposure Lamp

1) Put down the photosensitive drum.
2) Disconnect the connector ①, and remove the screw ②; then, remove the pre-exposure lamp unit.

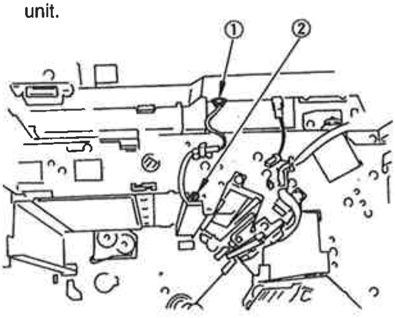


Figure 4-412

V. CHARGING SYSTEM

A. Photosensitive Drum Assembly

1. Construction

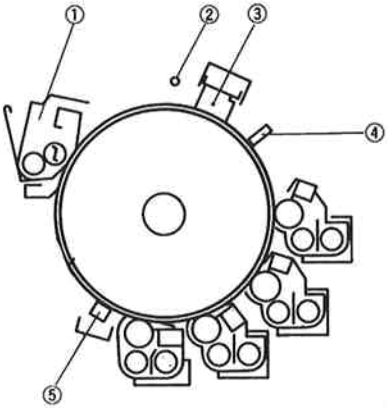


Figure 4-501

① Photosensitive drum cleaner
② Pre-exposure lamp
③ Primary corona assembly
④ Potential sensor
⑤ Black toner density sensor

2. Detaching the Photosensitive Drum

1) Turn off the power switch, and disconnect the power plug from the outlet.
2) Open the front door (left, right), and remove the two screws ①; then, remove the two hopper unit stopper fixings.

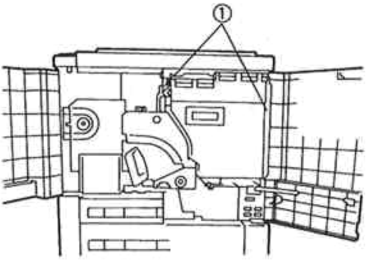


Figure 4-502

3) Open the hopper unit fully.
4) Remove the transfer drum rotating knob, and remove the transfer assembly cover.
5) Disconnect the connector ②, and remove the screw ③; then, slide out the primary corona assembly.

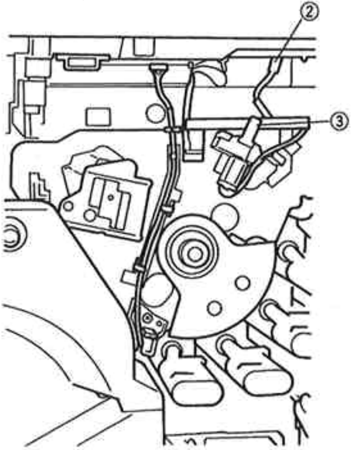


Figure 4-503

6) Loosen the screw ④, and turn the releasing lever ⑤ clockwise until it stops; then, tighten the screw ④, and disengage the cleaning blade from the photosensitive drum.

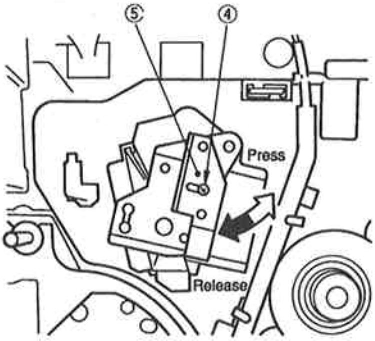


Figure 4-504

> **Caution:**
> Whenever installing the photosensitive drum cleaner unit, be sure to shift the blade releasing lever counterclockwise (locking position) and fix it securely in place with a screw.
> Further, you must not engage the blade releasing lever (ON) after removing the cleaning unit.

7) Remove the screw ⑥; then, slide the cleaning unit ⑦ slightly out, and tilt it to the left; then, slide it fully out to the front.

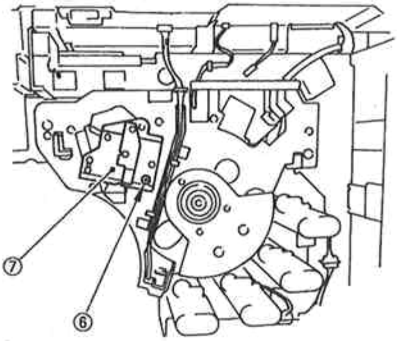


Figure 4-505

8) Remove the screw ⑧, and disconnect the connector ⑨; then, remove the pre-photosensitive drum cleaner paper sensor ⑩.

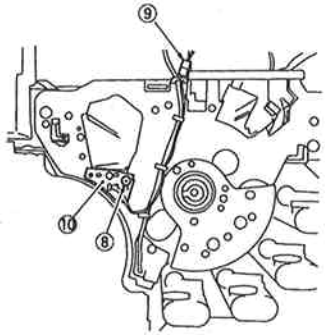


Figure 4-506

> **Caution:**
> When inserting the pre-photosensitive drum cleaner into the copier, be sure to guide it straight along the rail so as to avoid damage to the photosensitive drum.

9) Disconnect the connector ⑫ of the black toner density sensor unit ⑪, and remove the screw ⑬; then, remove the black toner density sensor.

10) Remove the screw ⑭, and remove the photosensitive drum fixing spacer ⑮.

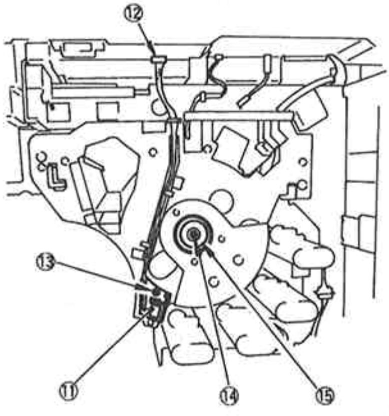


Figure 4-507

11) Remove the three screws ⑯, and loosen the two fixing pins ⑰; then, slide out the photosensitive drum frame unit ⑱.

Caution:
When sliding out the photosensitive drum, take extra care to avoid damage; if resistance is felt at the front, lift it slightly. Make sure that the transfer assembly frame is inside the copier.

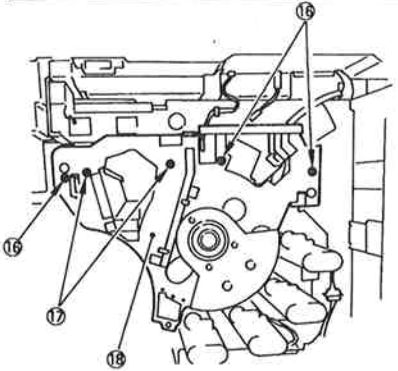


Figure 4-508

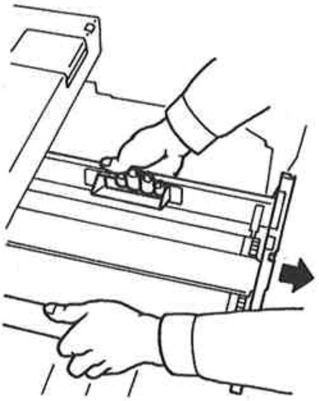


Figure 4-509

12) Hold the grip, and place it as shown in Figure 4-510.

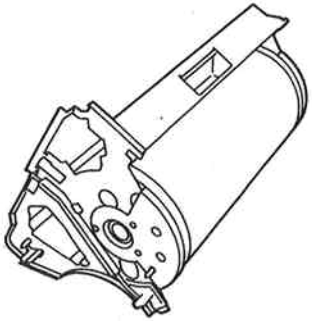


Figure 4-510

13) Remove the three screws ⑲, and remove the photosensitive drum block (front) ⑳.
14) Remove the three screws ㉑, and remove the photosensitive drum block (rear) ㉒.

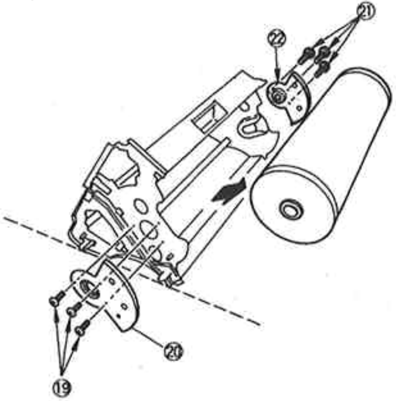


Figure 4-511

15) Slide out the photosensitive drum unit with care.

Reference:

Slide out the photosensitive drum unit as shown in Figures 4-512 and -513.

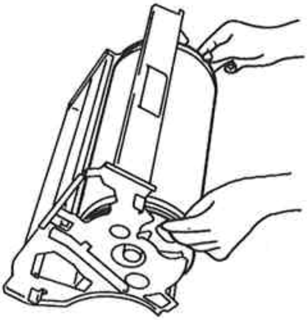


Figure 4-512

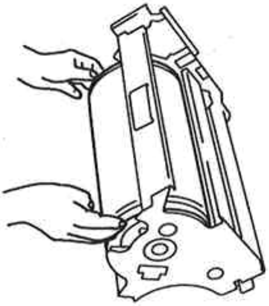


Figure 4-513

Caution:

The photosensitive drum is highly susceptible to light; if exposed to strong light for a long period of time, it may generate white spots or black band. Put the light-blocking sheet (or copy paper) around it and place it in a dark place whenever it has been removed from the copier.

16) Place the photosensitive drum unit with the drum heater friction plate at the bottom.

17) Remove the two screws ㉓, and remove the photosensitive drum flange (front) ㉔.

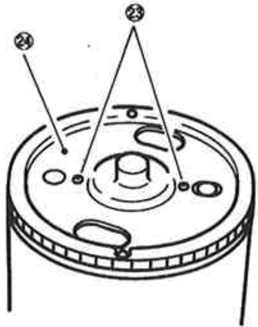


Figure 4-514

18) If the drum heater is installed, disconnect the connector ㉕, and pull out the drum heater ㉖.

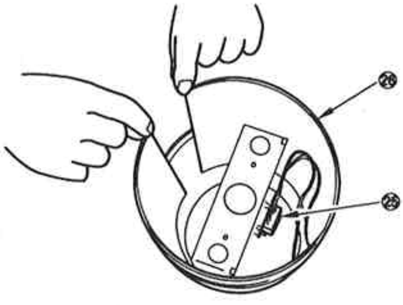


Figure 4-515

Reference:

The drum may recover to a degree that does not affect the copy quality if kept in a dark place for 24 hours after exposure to light of 600 lux; however, avoid exposing it to direct rays of the sun, which are as strong as 10,000 to 30,000 lux.

19) Lift the photosensitive drum carefully as shown in Figure 4-516.

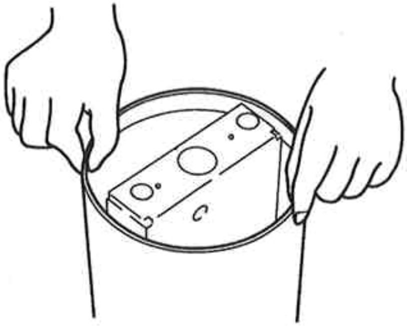


Figure 4-516

3. Cleaning the Photosensitive Drum

If the surface of the photosensitive drum is soiled, wipe it with a flannel cloth coated with toner; do not use paper, lint-free or otherwise.

> **Caution:**
> Do not dry wipe or do not use solvent; never use drum cleaning powder.

4. Replacing the Black Toner Density Sensor

1) Open the front right door.
2) Open the hopper.
3) Disconnect the connector, and remove the screw; then, remove the black toner density sensor unit.
4) Remove the two screws ①, and remove the black toner density sensor; then, disconnect the connector.

> **Caution:**
> Do not loosen any other screws than those shown, or the sensor will become displaced.

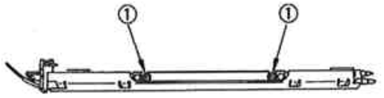


Figure 4-517

5. Detaching the Photosensitive Drum Cleaner Unit

1) Open the front door (left, right), and remove the screw; then, remove the hopper unit stopper fixing.
2) Open the hopper unit fully.
3) Loosen the screw, and turn the releasing lever ② clockwise until it stops; then, tighten the screw ①, and disengage the cleaning blade from the photosensitive drum.

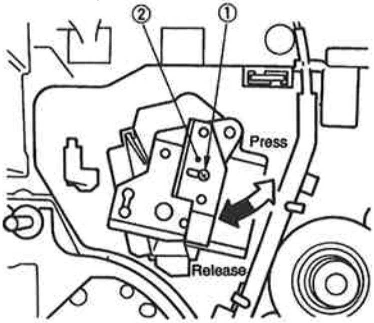


Figure 4-518

4) Remove the screw ④; then, slide the cleaning unit slightly out, and tilt it to the left; then, slide it fully out.

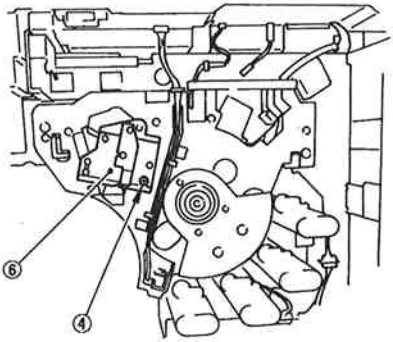


Figure 4-519

> **Caution:**
> Whenever installing the photosensitive drum cleaner unit, be sure to shift the blade releasing lever counterclockwise (locking position) and fix it securely in place with a screw.

Caution:
When inserting the photosensitive drum cleaner unit into the copier, be sure to guide it straight along the rail so as to avoid derailing it.
You must not engage the blade releasing lever (ON) after removing the cleaning unit.

6. Replacing the Photosensitive Drum Cleaner Blade

1) Remove the photosensitive drum cleaner unit.
2) Remove the two screws ①, and remove the photosensitive drum cleaner unit upper cover ②.

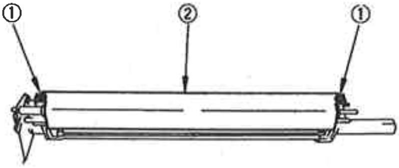


Figure 4-520

3) Remove the five screws ③, and remove the photosensitive unit cleaner blade.

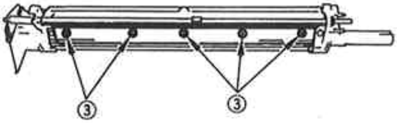


Figure 4-521

7. Replacing the No. 2 Blade

1) Open the front right door.
2) Open the hopper unit.
3) Disconnect the connector, and remove the screw; then, remove the black toner density sensor unit.
4) Remove the two screws ① of the No. 2 blade (front, rear); then, remove the No. 2 blade ②.

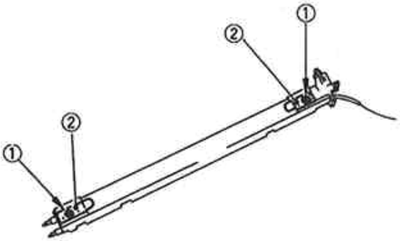


Figure 4-522

8. Replacing the Photosensitive Drum Scoop-Up Sheet

1) Remove the photosensitive drum cleaner unit.
2) Remove the three screws ①, and remove the photosensitive drum cleaner lower scraper ②.

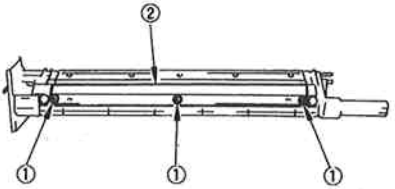


Figure 4-523

9. Detaching the Photosensitive Drum Cleaner End Seal (upper, lower)

1) Remove the photosensitive drum cleaner unit.
2) Remove the two screws ①, and remove the photosensitive drum cleaner unit upper cover ② when detaching the end seal (upper).

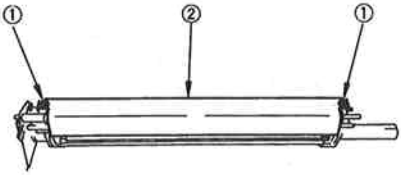


Figure 4-524

3) Remove the screws ③ to remove the end seal ④.

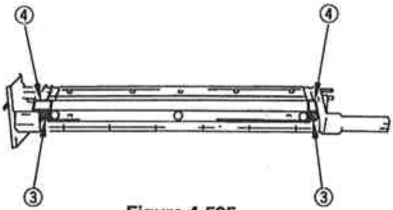


Figure 4-525

B. Corona Assemblies

1. Outline

The copier uses four corona assemblies, and corona wires of 0.06 mm in diameter are used.

The grid wire of the primary corona assembly is gold-plated and has a diameter of 0.1 mm.

2. Replacing the Wire Cleaning Pad of the Primary Corona Assembly

1) Remove the primary corona assembly.
2) Remove the two screws ①, and remove the shielding plate ②.

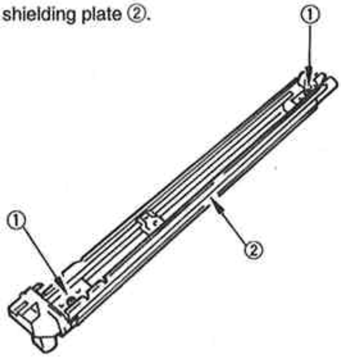


Figure 4-526

3) Remove the cleaning pad ③.

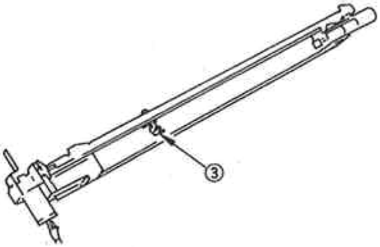


Figure 4-527

Caution:

Go through the following for cleaning and inspecting the primary corona assembly:

- Make thorough checks on the block (front, rear) for melting by leakage, deformation by heat, cracks and discoloration.
  If a fault is found, immediately replace it with a new part.
- When inspecting and cleaning the block (front, rear), be sure not to leave out the inside.
- Do NOT use a cloth carrying metal particles.
- Do NOT use a moist cloth. Instead, use lint-free paper to dry wipe it and then use alcohol. (Make sure that the part has completely dried before installing it back into the machine.)
- Make sure that the machine is serviced on a periodical basis and all periodically replaced parts are replaced on a periodical basis.

VI. DEVELOPING SYSTEM

A. Developing Assembly

1. Construction

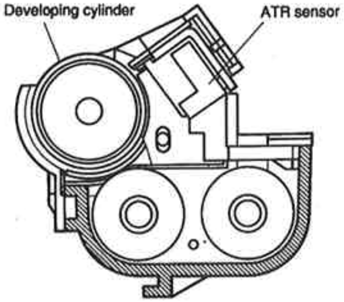


Figure 4-601

2. Removing the Y/M/C Developing Assembly

1) Open the front door.
2) Remove the screw, and remove the hopper stopper plate; then, full open the hopper.
3) Remove the screw ① of each of the developing assemblies, and disconnect the connector ②; then, remove the developing assembly with care.

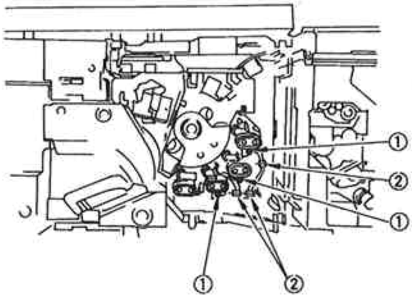


Figure 4-602

3. Removing the Bk Developing Assembly

1) Open the front door.
2) Remove the screw, and remove the hopper stopper plate; then, open the hopper fully.
3) Remove the screw of each of the developing assemblies, and remove the developing blade cover.

Caution:
If you have disconnected the connector when removing and installing the developing assembly, be sure to clean the inside of the ATR sensor connector.

4. Removing the ATR Sensor of the Y/M/C Developing Assembly

1) Remove the Y/M/C developing.
2) Remove the screw ①, and remove the developing blade cover ② by sliding it to the left.

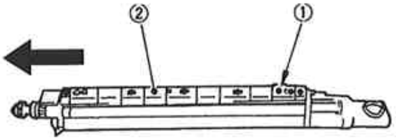


Figure 4-603

3) Remove the four screws ③, and disconnect the connector ④; then, remove the developing blade unit.

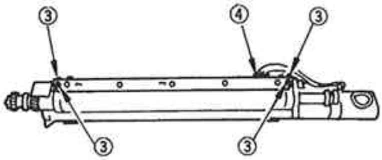


Figure 4-604

4) Remove the three screws ⑤, and remove the ATR sensor ⑥.

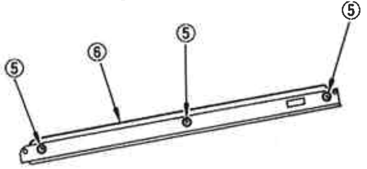


Figure 4-605

5. Removing the Developing Cylinder

1) Remove the Y/M/C developing assembly.
2) Remove the screw ①, and remove the developing blade cover ②.

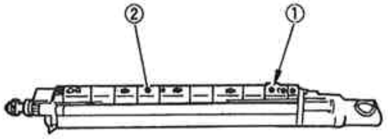


Figure 4-606

3) Remove the four screws ③, and disconnect the connector ④; then, remove the blade unit.

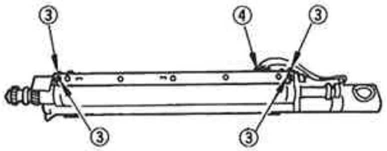
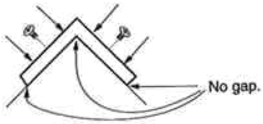


Figure 4-607

Caution:
To assemble, force the developing blade unit down as shown, and screw it in place.



4) Remove the three screws ⑤, and remove the developing assembly lower cover ⑥.

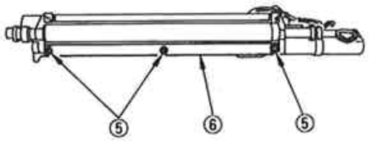


Figure 4-608

5) Remove the resin screw ⑦ from the front of the developing assembly, and remove the electrode plate cover ⑧.

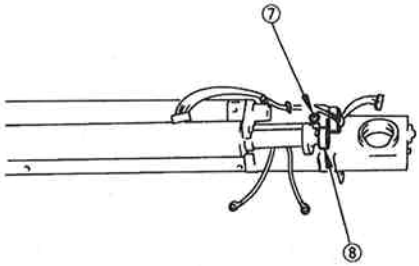


Figure 4-609

6) Remove the two screws ⑨, and remove the electrode ⑩ of the developing cylinder.

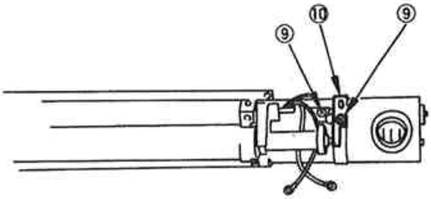


Figure 4-610

7) Remove the grip ring ⑪, bearing ⑫, and spacer ⑬.

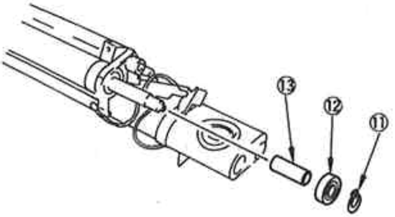


Figure 4-611

Caution:
During assembly, be sure to create a gap of 0.2 ±0.1 mm between the bearing ⑫ and the grip ring.

8) Remove the two E-rings ⑭, grip ring ⑮, three gears ⑯, spacer ⑰, and sleave slider ⑱ from the rear of the developing assembly.

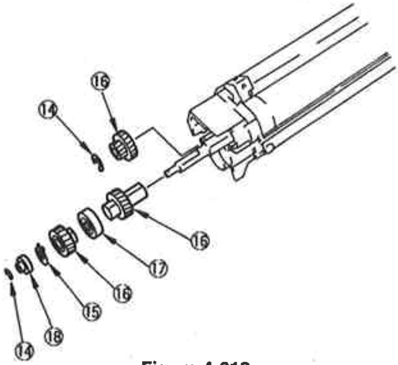


Figure 4-612

Caution:
During assembly, check to make sure that there is no gap between the gear ⑯ and the grip ring ⑮.

9) Push the bearings ⑲ on both ends of the developing cylinder toward the outside, and pull out the cylinder ⑳.

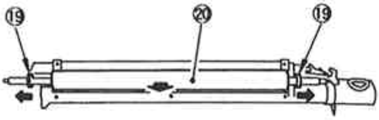


Figure 4-613

Caution:
Force the sleeve in the direction of Y while butting the bearing against the wall X1 of the case; then, install the grip ring Z. (Make sure there is no gap.)
Thereafter, butt the bearing on the opposite side against the wall X2 of the case; then, install the grip ring so that the gap between the grip ring and the roll is 0.2 ±0.1 mm.

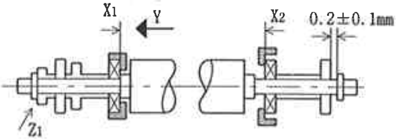


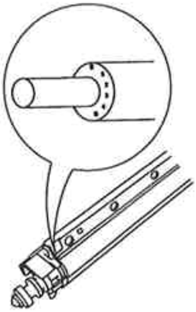
Figure 4-614

Caution:
If poor contact is noted between the developing assembly drive unit and the developing assembly high-voltage supply unit, or a development fault caused by such poor contact, replace the sleeve slider ⑱ (Figure 4-612) with a new part as shown in "XI Others" in Chapter 4.

Caution:
The developing cylinders are not compatible since the polarity orientation differs from one cylinder to another (color). Identify the correct developing cylinder by the color marking on the edge of its shaft.

The developing sleeve for cyan comes in two types, identified by the lot number marking found on its end. (See Figure 4-615.)

To avoid adjustment of the S-B gap at time of replacing the sleeve for cyan, use a sleeve obtained from the manufacturer that produced the one already in the developing assembly.



Lot No. : B5234B

Manufacturer's marking
(B: Company B, M: Company M)

Lot No.

Figure 4-615

If you have replaced the developing blade, make adjustments using the appropriate service tool (FY9-3015); see Table 4-601 for the S-B gap of each sleeve.

Developer color	S-B gap
Yellow	0.70mm
Cyan (Company B)	0.70mm
Cyan (Company M)	0.92mm
Magenta	0.70mm
Black	0.90mm

Table 4-601

Adjusting the S-B Gap

Put two gauges of the appropriate color (service tool FY9-3015-000) between the developing blade and the sleeve, and fix the developing blade in place.

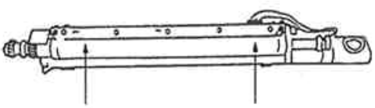


Figure 4-616

Caution:
If the developing assembly is inserted at an angle, its gear at the rear can damage the photosensitive drum.
Be sure to insert it along the rail while holding it straight so that the gear will not come into contact with the drum.

Caution:
When inserting the black developing assembly, be sure that it will not override the rail.

B. Hopper Assembly

1. Opening the Hopper

1) Open the front door.
2) Remove the screw ①, and remove the hopper stopper plate; then, open the hopper fully.

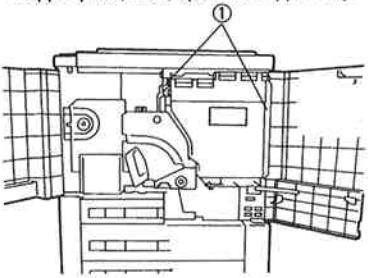


Figure 4-617

2. Removing the Hopper Unit

1) Open the hopper.
2) Disconnect the three connectors from the bottom of the hopper unit.

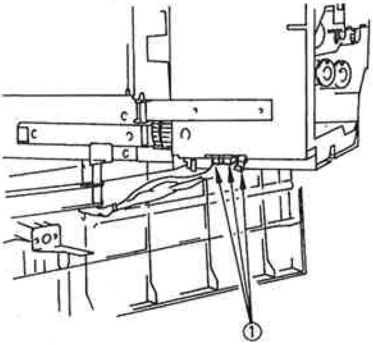


Figure 4-618

3) Hold the hopper unit as shown in Figure 4-619, and lift it.

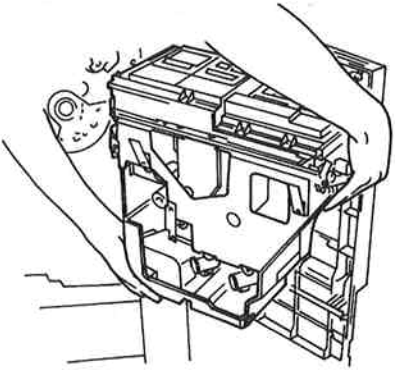


Figure 4-619

3. Removing the Hopper Motor

1) Remove the hopper unit.
2) Remove the two screws ①, and remove the hopper cover ②.

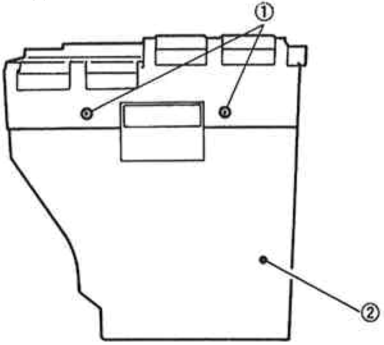


Figure 4-620

3) Remove the grip ring ③, and remove the gear ④.

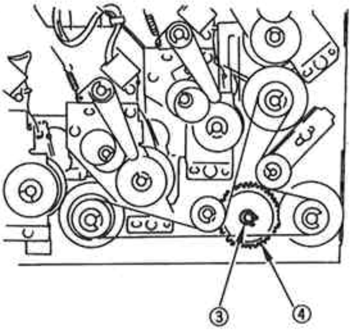


Figure 4-621

4) Remove the screw ⑤, and remove the toner receptacle ⑥.

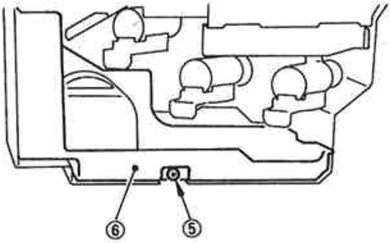


Figure 4-622

> **Caution:**
> If the hopper motor fails to turn on or off, the transistor on the DC controller PCB may be damaged.
> Be sure to replace the DC controller PCB as necessary.

5) Disconnect the connector ⑦, and remove the two screws ⑧; then, remove the hopper motor ⑨.

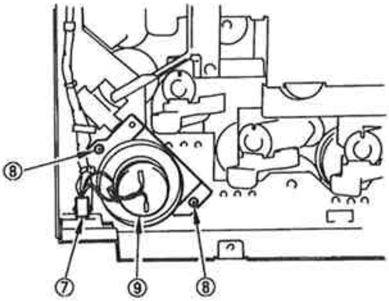


Figure 4-623

4-1. Removing the Toner Supply Clutch (TYPE 1)

1) Install the toner stopper to the toner supply mouth, and remove the hopper unit; then, remove the hopper cover.

For Black Toner

2) Remove the E-ring ① and bushing ② on the toner supply mouth side.

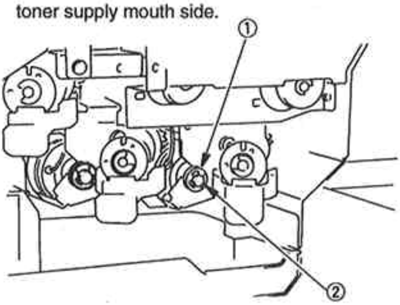


Figure 4-624

3) Remove the two E-rings ③ on the hopper drive side, and remove the lever ④ and spring ⑤.

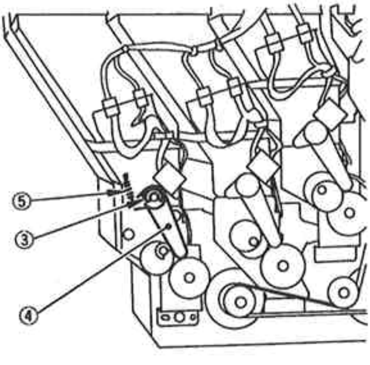


Figure 4-625

4) Disconnect the connector ⑥, and remove the E-ring ⑦ and gear ⑧ (pay attention to the parallel gear) equipped with a cam; then, remove the three screws ⑨, and remove the gear unit ⑩.

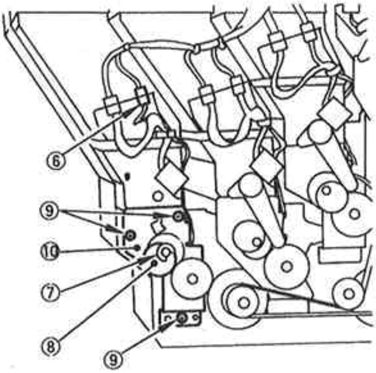


Figure 4-626

5) Remove the two E-rings ⑪, and remove the two gears ⑫; then, remove the toner supply clutch.

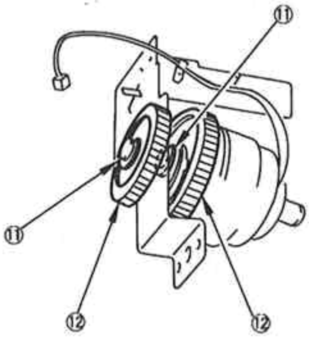


Figure 4-627

4-2. Removing the Toner Supply Clutch (TYPE 2)

The discussions that follow are based on the black hopper.

1) Remove the hopper unit, and remove the hopper cover.
2) Remove the six screws ①, and remove the hopper upper cover ②.

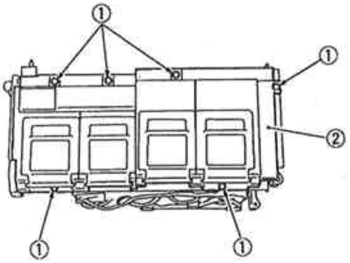


Figure 4-628

3) Remove the two screws ③, and remove the reinforcing plate ④.

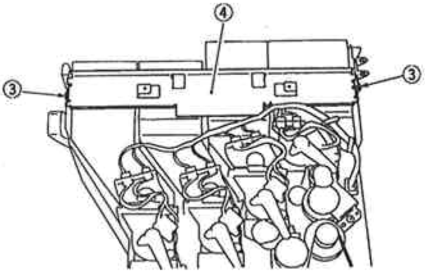


Figure 4-629

4) Remove the screw ⑤, and disconnect the two connectors ⑥; then, remove the black hopper.

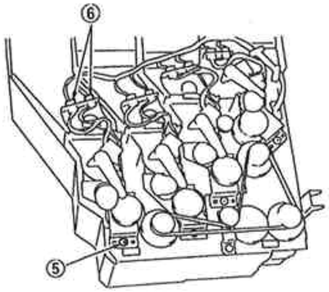


Figure 4-630

5) Remove the E-ring, bar, spring, E-ring, gear with a cam (pay attention to the parallel gear), two-E-rings, and two gears from the hopper drive assembly; then, remove the clutch.

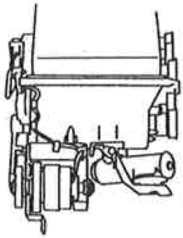


Figure 4-631

VII. FIXING SYSTEM

A. Fixing Assembly

1. Detaching the Fixing Assembly

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing assembly cover.
3) Slide out the transfer assembly frame.
4) Hold the grip at the front and the pin at the rear of the fixing assembly, and lift the assembly to remove.

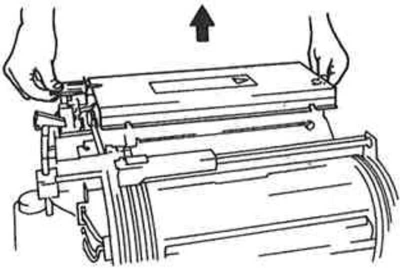


Figure 4-701

2. Opening the Upper Fixing Roller Unit

1) Open the front left door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Remove the two screws, and remove the upper fixing cover.
5) Open the inside delivery (fixing/delivery assembly), and remove the two screws ①; then, remove the upper fixing roller unit ②.

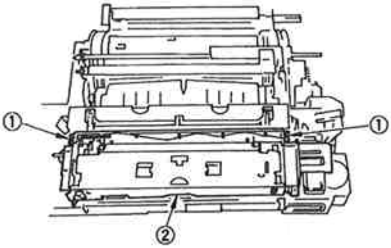


Figure 4-702

3. Removing the Upper Fixing Heater

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Pull out the faston ① from the rear of the upper fixing heater.

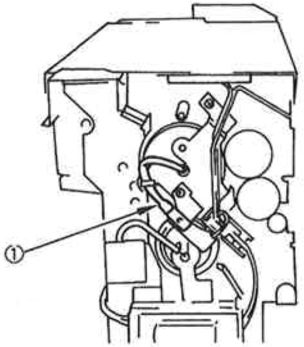


Figure 4-703

5) Pull out the faston ② from the front of the upper fixing heater; then, remove the screw ③ and metal fixing ④.

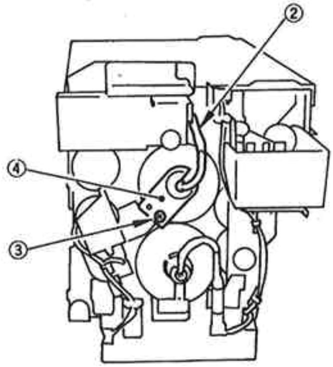


Figure 4-704

6) Pull out the upper fixing heater toward the front.

4. Detaching the Upper Fixing Roller

1) Open the front door.
2) Remove the transfer frame cover and fixing cover.
3) Slide out the transfer frame.
4) Remove the upper fixing heater.
5) Remove the upper fixing roller metal fixing ① (each from front and rear).

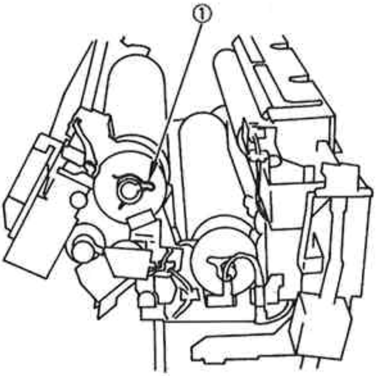


Figure 4-705

6) Move the bearing ② at the upper fixing roller, and pull out the upper fixing roller ③ as shown in Figure 4-706.

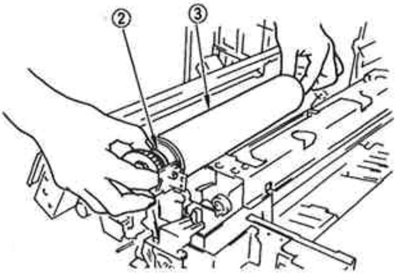


Figure 4-706

5. Detaching the Lower Fixing Heater

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Pull out the transfer assembly frame.
4) Pull out the faston ① at the rear of the lower fixing heater.

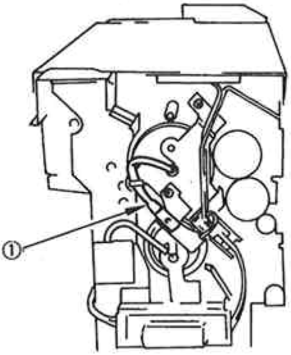


Figure 4-707

5) Pull out the faston ② at the front of the lower fixing heater; then, remove the screw ③ and metal fixing ④.

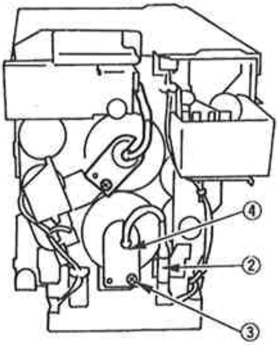


Figure 4-708

6) Pull out the lower fixing heater toward the front.

6. Removing the Lower Fixing Roller

1) Open the front door.
2) Remove the transfer frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Put down the fixing assembly unit.
5) Remove the screw ①, and slide the fixing assembly inlet guide ② toward the rear to remove.

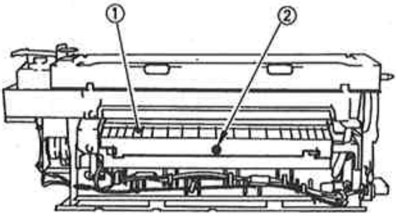


Figure 4-709

6) Remove the lower fixing heater.
7) Open the upper fixing roller unit.
8) Remove the lower fixing roller metal fixing ③ (each from front and rear).

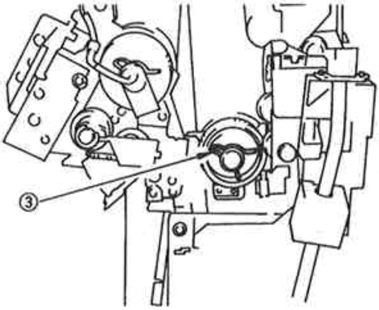


Figure 4-710

9) Remove the screw ④, and remove the lower fixing roller static eliminator brush ⑤.

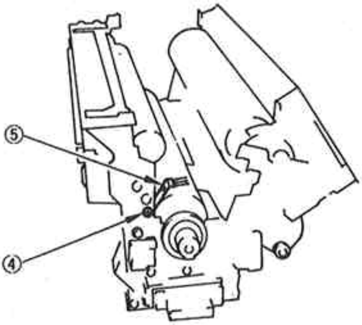


Figure 4-711

10) Move the bearing at the rear of the lower fixing roller, and pull out the lower fixing roller as shown in Figure 4-712.

> **Caution:**
> When attaching the roller, take care not to damage it by hitting the thermistor.

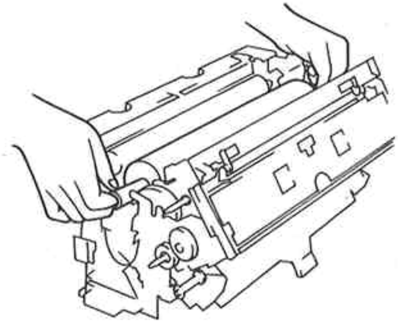


Figure 4-712

7. Identifying the Lower and Upper Fixing Rollers (front, rear)

- The end of the lower fixing roller is equipped with a collar.
- The upper fixing roller does not have a collar, but has a cut-off at the front and rear.
- The side with Teflon tape or PFA tube must be at the rear.

8. Removing the Fixing Assembly Thermistor (upper, lower)

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Put down the fixing assembly unit.
4) Remove the screw ①, and disconnect the connector ② (front); then, remove the upper fixing assembly thermistor.

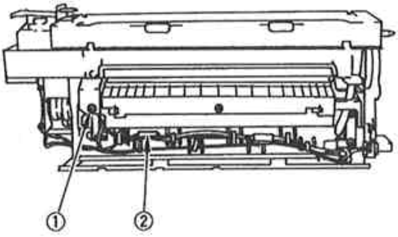


Figure 4-713

5) Remove the screw ③, and disconnect the connector ④ (rear); then, remove the lower fixing assembly thermistor.

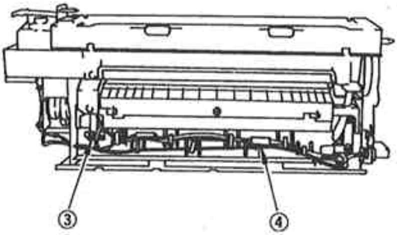


Figure 4-714

9. Detaching the Fixing Assembly Thermal Switch (lower)

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Put down the fixing assembly unit.
4) Remove the screw ①, and remove the lower fixing thermal switch ② together with its mount.

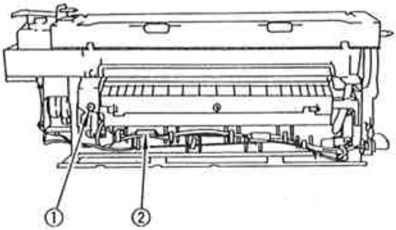


Figure 4-715

5) Detach the lower fixing thermal switch from the mount.

10. Removing the Fixing Thermal Switch (upper)

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Remove the two screws, and remove the upper fixing assembly.
4) Remove the cleaning belt unit.
5) Remove the screw, and remove the thermistor together with its mount.
6) Pull out the two fastons ①.

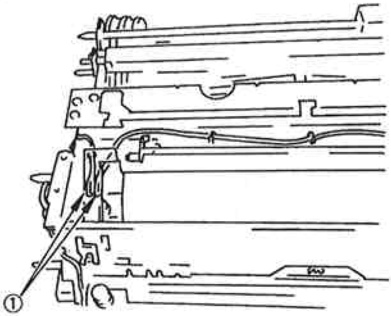


Figure 4-716

11. Adjusting the Fixing Nip

1) Execute 'NIP-CHK' of 'FUSER' under 'FUNC' in service mode.

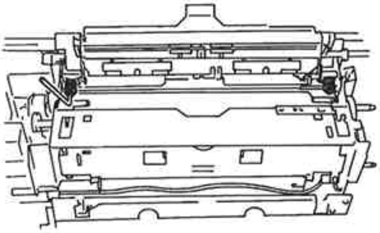


Figure 4-717

2) If the nip pressure is not as indicated, adjust it using the adjusting nut.

B. Fixing Assembly Cleaner

1. Detaching Cleaning Belt

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Remove the two screws, and remove the fixing assembly upper cover.
4) Remove the two cleaning belt pressure springs ①.

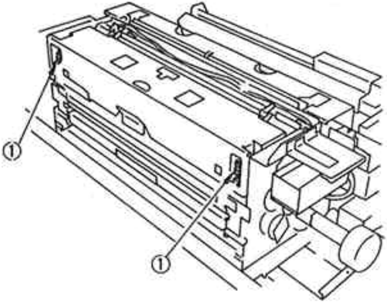


Figure 4-718

5) Insert a metal ruler or flat-blade screwdriver into the stop plate ② to release force to the fixing assembly cleaning belt.

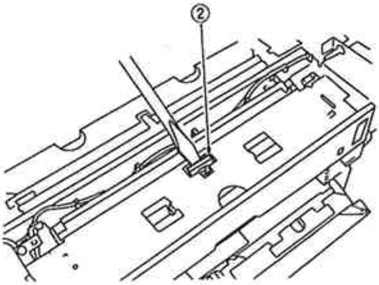


Figure 4-719

6) Remove the screw ③, and remove the hinge of the cleaning belt unit; then, remove the cleaning belt unit.

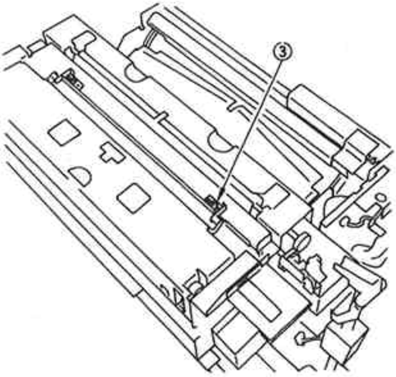


Figure 4-720

7) Remove the two screws ④, and remove the two bushings ⑤; then, remove the cleaning belt.

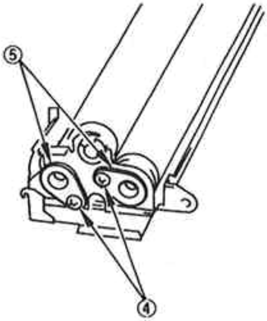


Figure 4-721

2. Attaching the Cleaning Belt

The service parts for the cleaning belt consist of the feeding shaft, take-up shaft, and belt integrated as a single entity.

Install the component parts as in detaching them but only in reverse; keep the following in mind.

1) Wind the belt two to three times around the take-up shaft.
2) After attaching the belt, put the detecting portion ② of the length detecting lever ① in the belt; then, remove the slack. .

> **Caution:**
> The cleaning belt can become slack if the upper roller unit has been opened and is closed after maintenance.
> Operate the cleaning belt drive unit 10 to 20 times by hand after finishing maintenance work to remove the slack.

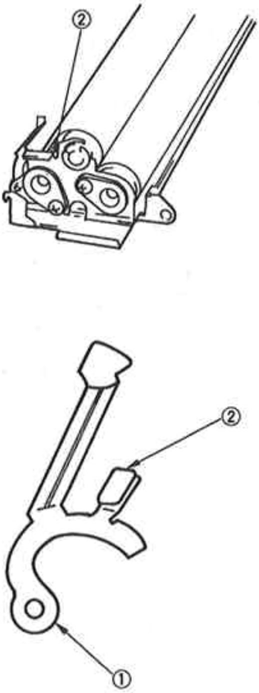


Figure 4-722

C. Fixing Oil Applying Assembly/Removing Assembly

1. Detaching the Oil Applying Roller Unit

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing assembly cover.
3) Slide out the transfer assembly frame.
4) Remove the fixing assembly upper cover, and open the upper fixing roller unit.
5) Remove the four screws ①, and remove the oil applying roller unit ②.

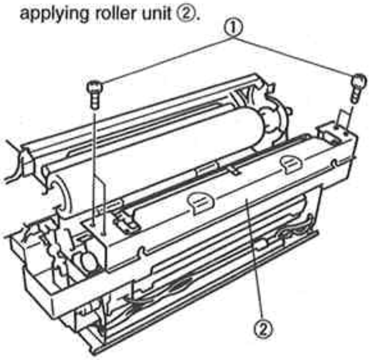


Figure 4-723

2. Detaching the Oil Applying Roller Blade

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Open the upper fixing roller unit.
5) Fully open the oil applying roller blade unit ①, and pull it out.

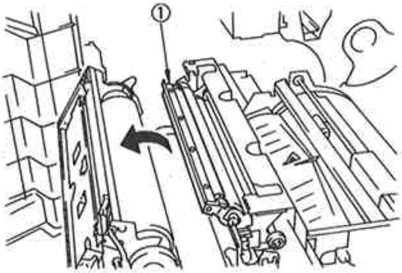


Figure 4-724

6) Remove the four screws ②, and remove the oil applying roller blade.

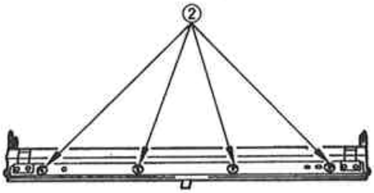


Figure 4-725

3. Detaching the Oil Applying Roller

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Remove the upper fixing assembly cover.
5) Open the upper fixing roller unit.
6) Remove the oil applying roller blade.
7) Remove the two E-rings ① (one each from front and rear), remove the two bushings ② (one each from front and rear), and remove the gear ③ from the rear. (Take care not to let the parallel pin ④ slip off the gear.)

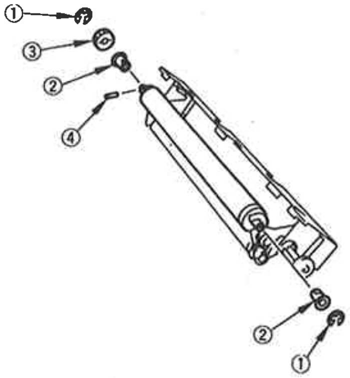


Figure 4-726

4. Detaching the Oil Removing Blade

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Put down the fixing assembly unit.
4) Open the upper fixing roller unit.
5) Remove the two screws ①, and pull out the oil removing blade ②.

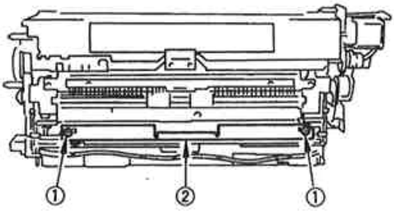


Figure 4-727

Caution:
Install the oil removing blade so that the ID marking (white, indelible ink) is toward the blade mount.
Otherwise, it may not properly remove oil or can wear out the lower fixing roller fast.

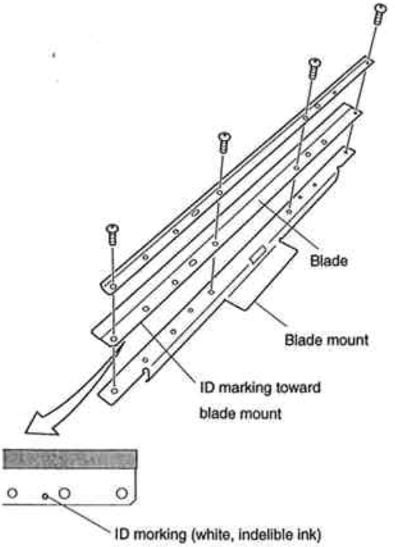

Blade
Blade mount
ID marking toward blade mount
ID morking (white, indelible ink)

Figure 4-728

D. Internal Delivery Assembly

1. Detaching the Fixing Assembly Separation Claw

1) Open the front door.
2) Remove the fixing cover.
3) Remove the two screws ①, and remove the separation claw metal fixing ②.
4) Remove the four fixing separation claws.

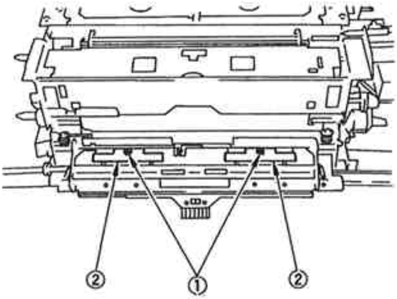


Figure 4-729

Caution:
Be sure to replace the claw spring at the same time.

VIII. DUPLEXING UNIT

A. Pick-Up Assembly

1. Removing the Pick-Up Roller

1) Remove the duplexing unit pick-up assembly.
2) Remove the E-ring ① (made of resin), and pull out the pick-up roller ② together with its collar.

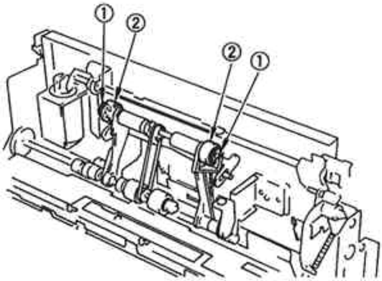


Figure 4-801

Caution:

a. When attaching the pick-up roller ① to the pick-up assembly, make sure that the side with a round marking ② on the rubber portion is toward the copier's front.

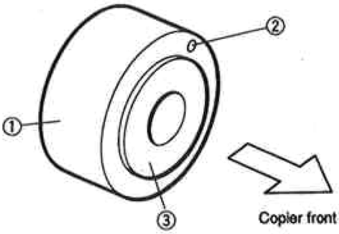


Figure 4-802

The pick-up rollers are identified by color ③ as follows:
brass for the front
silver for the rear
Make sure the correct rollers are used.

b. Do not remove the rubber portion of the pick-up roller from the collar.

2. Removing the Feeding Roller 1

1) Remove the duplexing unit pick-up assembly.
2) Remove the screw ①, and remove the pick-up roller arm bushing ②.
3) Remove the E-ring ③ (made of resin).

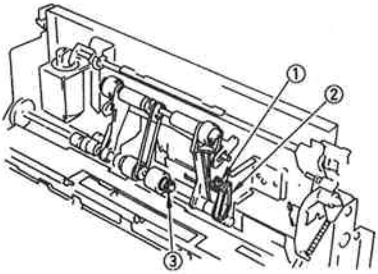


Figure 4-803

4) Pull out the feeding roller ⑤ together with the belt ④.

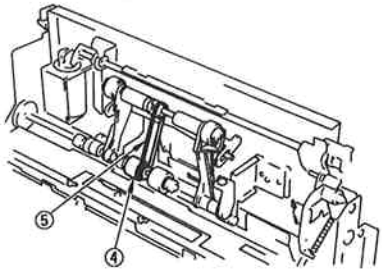


Figure 4-804

Caution:
When attaching the feeding roller ① to the pick-up assembly, make sure that the gear ② installed to the feeding roller is toward the copier's rear.

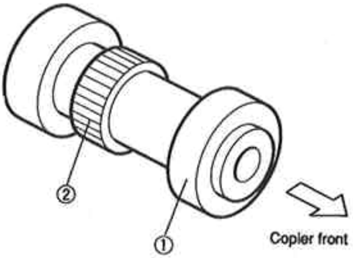


Figure 4-805

3. Detaching the Feeding Roller 2

1) Remove the duplexing unit pick-up assembly.
2) Remove the two screws ①, and remove the duplexing unit pick-up assembly internal guide ②.

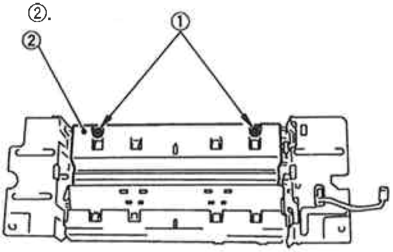


Figure 4-806

3) Remove the two E-rings ③ (made of resin).

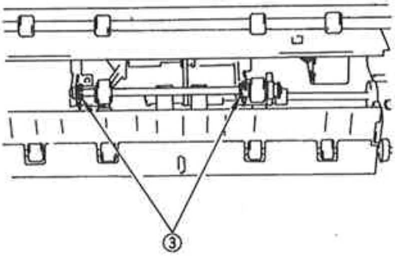


Figure 4-807

4) Shift the two feeding roller 2 bushings ④ toward the inside, and remove them together with the shaft ⑤.

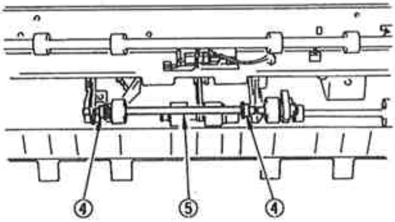


Figure 4-808

5) Remove the two E-rings ⑥ (made of resin) and gear ⑦; then, remove the feeding roller 2 from the shaft.

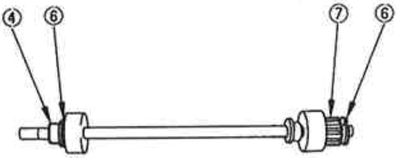


Figure 4-809

Caution:
The gear ⑦ is fixed to the feeding roller 2 shaft with a parallel pin; take care not to drop the pin when detaching and attaching the gear.

4. Detaching the Separation Roller

1) Remove the duplexing unit pick-up assembly.
2) Remove the screw ②, and remove the separation roller cover ①.

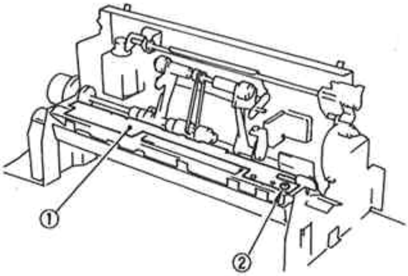


Figure 4-810

3) Remove the screw ④, and remove the separation roller unit ③.

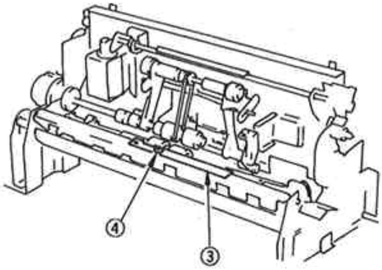


Figure 4-811

4) Remove the two E-rings ⑤ (made of resin).
5) Pull out the separation roller shaft ⑥, and remove the separation roller ⑦.

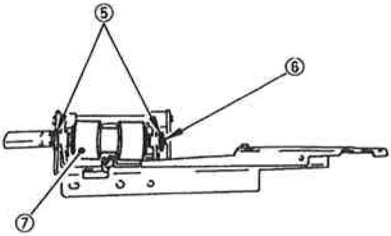


Figure 4-812

Caution:
When attaching the separation roller ① to the pick-up assembly, make sure that the D-shaped cut-out is toward the front.

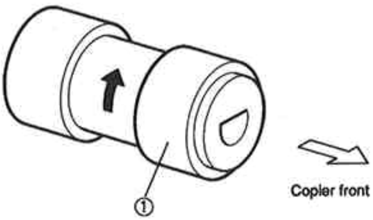


Figure 4-813

5. Positioning the Pick-Up Roller Releasing Solenoid (SL21)

1) Remove the duplexing unit pick-up assembly.
2) Place the duplexing unit pick-up assembly as shown in Figure 4-814, and hold the lever ① so that the pick-up roller ② drops on its own.
3) Adjust the pick-up roller releasing solenoid (SL21) so that the length L is 65 ±1 mm.

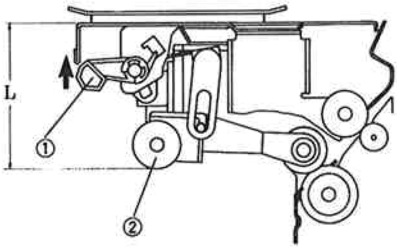


Figure 4-814

B. Feeding Assembly

1. Removing the Duplexing Unit

1) Slide out the cassettes 3 and 4.
2) Remove the lower right cover.
3) Open the pick-up door and duplexing reversing assembly door.
4) Remove the two screws ①, and remove the two stopper plates ②.

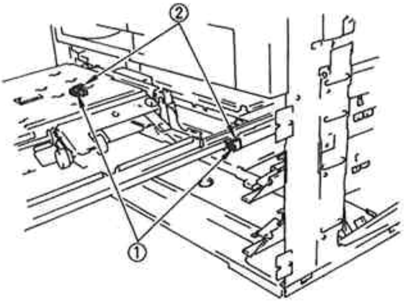


Figure 4-815

5) Slide out the duplexing unit.

2. Removing the Feeding Roller

1) Remove the duplexing unit.
2) Remove the two grip rings ①, and remove the feeding roller ③ from the roller shaft ②.

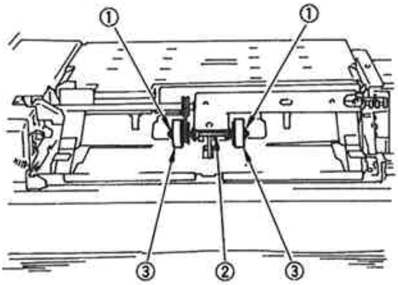


Figure 4-816

3. Removing the Curl Pressing Sheet

1) Remove the duplexing unit.
2) While lifting the duplexing feeding assembly ①, remove the six screws ②, and remove the six curl pressing sheets ③.

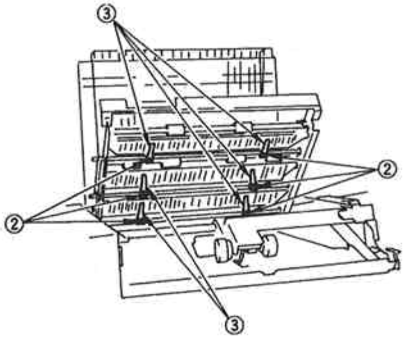


Figure 4-817

3) Remove the two screws ④, and remove the remaining two curl pressing sheets ⑤.

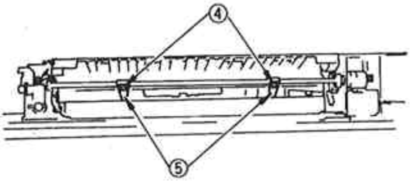


Figure 4-818

Caution:
Do not touch the portion where the gear (pulley) fixed to the shaft of the decurling sheet and the belt engage with each other; the parts are engaged with high accuracy.

4. Detaching the Duplexing Stacking Assembly Heater

1) Remove the duplexing unit.
2) Remove the four screws ①, and remove the front cover ②.

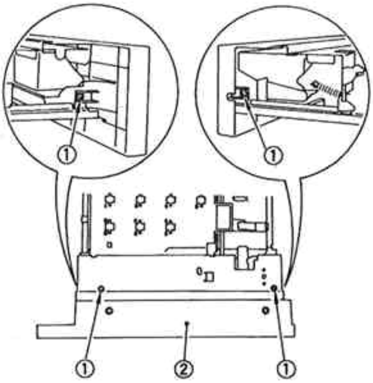


Figure 4-819

3) Remove the screw ③, and remove the spring ④; then, remove the grip ⑤.

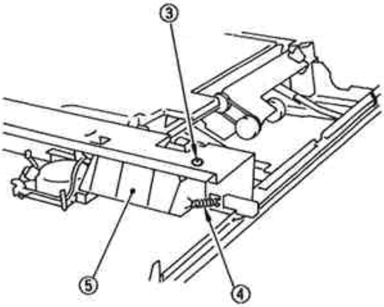


Figure 4-820

4) Remove the E-ring ⑥, and remove the bushing ⑦.

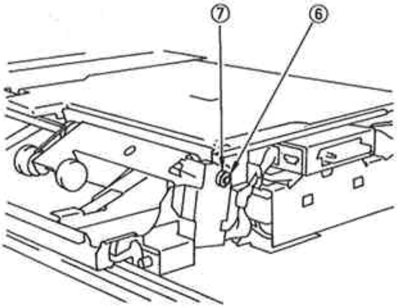


Figure 4-821

5) Remove the feeding roller drive belt ⑧ from the gear, and pull out the feeding roller shaft ⑨ from the front.

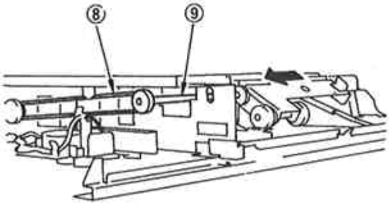


Figure 4-822

6) Remove the two screws ⑩ used to hold the paper jogging guide in place.

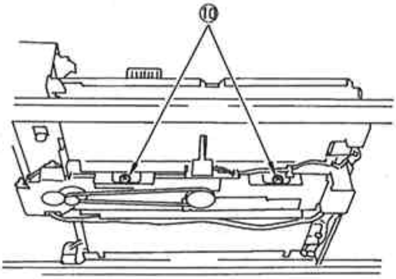


Figure 4-823

7) Remove the four screws ⑫ used to hold the heater base plate ⑪.

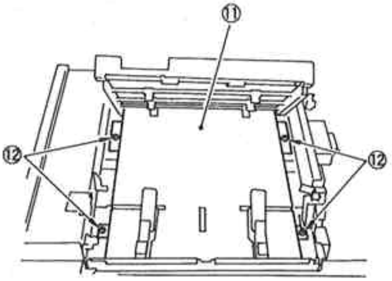


Figure 4-824

8) Hold up the edge of the heater base plate ⑬, and pull out the mount together with the two paper jogging guides ⑭ in the direction of the arrow.

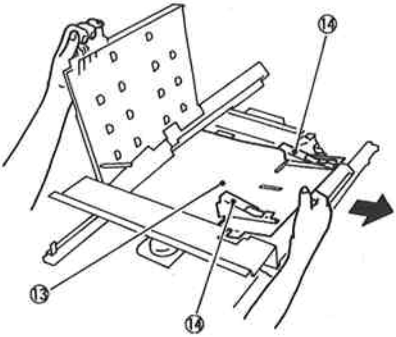


Figure 4-825

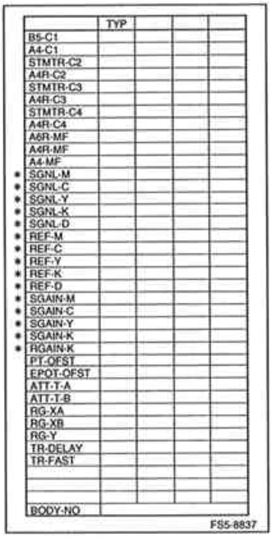
IX. ELECTRICAL SYSTEM

1. Replacing the DC Controller PCB

Execute 'BACK UP' in service mode before replacing the PCB.

1) Remove the rear over.
2) Remove the eight screws, disconnect the connector.
3) After replacing the DC controller PCB, go through the following:

- Replace the developer (all four colors), and execute 'STIR-4' and 'INIT-4' under 'FUNC → INSTALL'.
  Record the results on the service label (those indicated by * in Figure 4-901). However, for 'SGNL-K', enter a value obtained by adding '37' to the result.
- Enter the values recorded on the service value (only those not indicated by * in Figure 4-901) in 'FUNC → D-CON'. However, for 'SGNL-K', add a value obtained by adding '37' once again.
- When you have entered all values for each screen, press 'SEND'.
- Set 'PASCAL' of 'ADJUST → PASCAL' to '1'.
- When you have finished entering all values, turn off and then on the power switch.



	TYP			
B5-C1				
A4-C1				
STMTR-C2				
A4R-C2				
STMTR-C3				
A4R-C3				
STMTR-C4				
A4R-C4				
A6R-MF				
A4R-MF				
A4-MF				
* SGNL-M				
* SGNL-C				
* SGNL-Y				
* SGNL-K				
* SGNL-D				
* REF-M				
* REF-C				
* REF-Y				
* REF-K				
* REF-D				
* SGAIN-M				
* SGAIN-C				
* SGAIN-Y				
* SGAIN-K				
* RGAIN-K				
PT-OFST				
EPOT-OFST				
ATT-T-A				
ATT-T-B				
RG-XA				
RG-XB				
RG-Y				
TR-DELAY				
TR-FAST				
BODY-NO				

FS5-8837

Figure 4-901

2. Detaching the Image Processor PCB (IP-MAIN/IP-ED/IP-IF/IP-ECO)

1) Remove the upper delivery assembly cover.
2) Remove the two screws ①, and remove the image processor PCB cover.

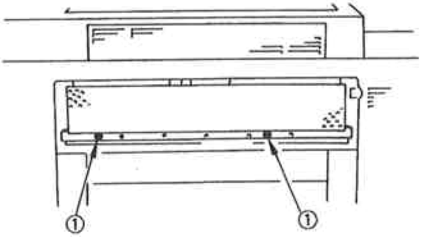


Figure 4-902

3) (Only if the IP-ED or IP-IF PCB installed; skip the step if you are detaching the IP-ECO.) Remove the two screws ②, and remove the interface harness retainer.

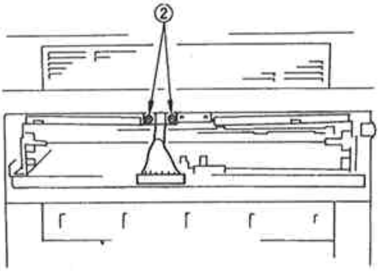


Figure 4-903

4) Remove the two screws from both ends of the PCB you are removing; then, shift up the levers on both ends, and pull out the image processor PCB.

3. Replacing the Analog Processor PCB

1) Remove the copyboard glass, and remove the lens mount cover.
2) Remove the laser scanner cover.
3) Remove the two screws ①, and remove the IP upper cover ②; then, disconnect the connector ③, from the IP motherboard.

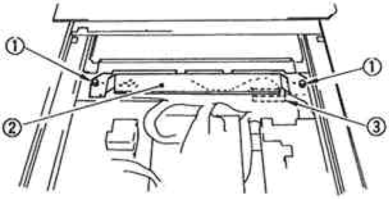


Figure 4-904

4) Remove the harness cover ④, remove the two screws ⑤, and disconnect the three connectors ⑥ (J2501, J2503, J2504); then, remove the analog processor PCB ⑦.

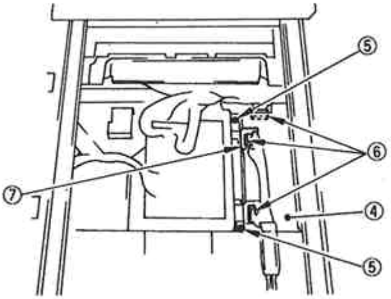


Figure 4-905

Caution:
Take care not to trap the flat cable of the image processor PCB between the base plate and the analog processor PCB.

4. Replacing the Reader Controller PCB

1) Remove the reader controller PCB cover and upper right cover.
2) Remove the three screws ①, and remove the reader controller cooling fan stay ②.

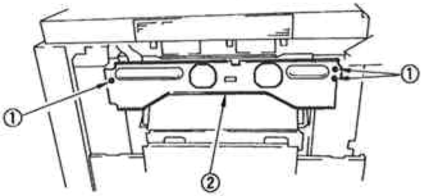


Figure 4-906

3) Disconnect the seven connectors ③, and remove the six screws ④; then, remove the reader controller PCB ⑤.

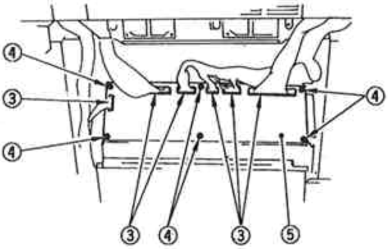


Figure 4-907

4) After replacing the reader controller PCB, go through the following:

- Enter the values recorded in the service label (indicated by * in Figure 4-908) by executing 'R-CON' under 'FUNC' in service mode.
- Execute AUTO-ADJ' of 'CCD' under 'FUNC'; record the results (indicated by * in Figure 4-908) on the service label.
- If a projector is installed, execute 'FUNC → PRJ-ADJ → PRJ-CCD' in service mode.
- When you have finished entering all values, turn off and then on the power switch.

	TYP		
CVR-TYPE			
ADJ-X			
ADJ-Y			
ADJ-S			
ED-ADJ-X			
ED-ADJ-Y			
ADJ-J			
EC-GLASS			
DA-XS			
DA-XE			
DA-YS			
DA-YE			
DS-DOC			
DS-PRJ			
DS-OHP			
ADJ-M			
ADJ-C			
ADJ-Y			
ADJ-K			

		TYP		
	OFST-M			
	OFST-C			
	OFST-Y			
	OFST-K			
	SEG-ADJ			
	BC-ADJ			
	LGCR-IPU			
*	LAMP-DT			
*	GAIN-B			
*	GAIN-G			
*	GAIN-R			
*	TARGET-B			
*	TARGET-G			
*	TARGET-R			

Figure 4-908

5. Detaching the HVT PCB

1) Remove the rear cover.
2) Disconnect the seven high-voltage connectors ① from the HVT PCB.
3) Disconnect the three connectors ② (J1, J2, J3).
4) Disconnect the connector, and remove the three screws ③; then, remove the HVT PCB ④.

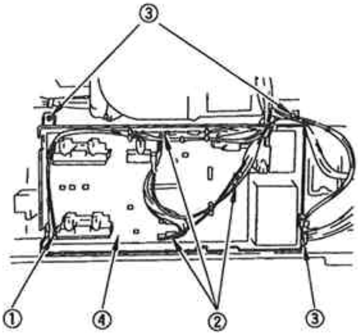


Figure 4-909

6. Detaching the Developing Bias PCB

1) Remove the rear cover.
2) Remove the HVT PCB.
3) Disconnect the two connectors ①, and remove the two screws ②; then, remove the developing bias PCB together with the PCB case.

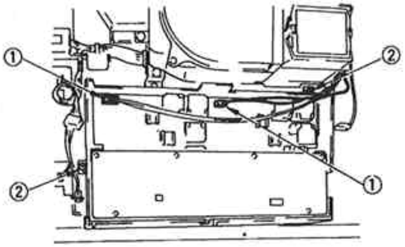


Figure 4-910

7. Detaching the Scanner Motor Driver PCB

1) Remove the copyboard glass and the lens mount cover.
2) Remove the laser scanner cover.
3) Disconnect the three connectors ① (J01, J02, J03), and remove the two screws ②; then, remove the scanner motor driver PCB ③.

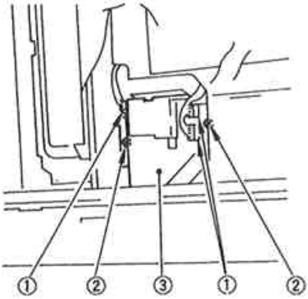


Figure 4-911

8. Detaching the Laser Scanner Motor Controller PCB

1) Disconnect the power plug.
2) Remove the copyboard glass and the lens mount cover.
3) Remove the four screws ①, and remove the laser scanner cover ②.
4) Remove the scanner motor driver.

Caution:
Move the mirror mount fully to the left. Moreover, take care not to damage the power line ③ of the scanning lamp.

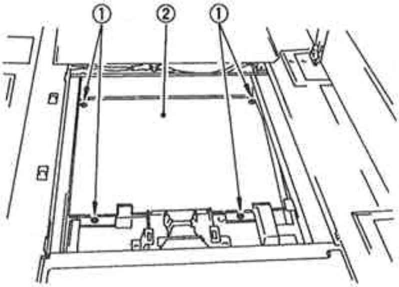


Figure 4-912

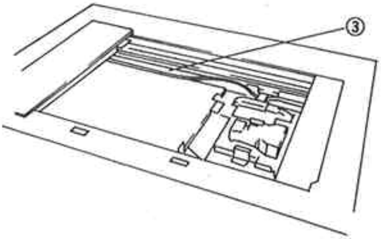


Figure 4-913

Cut-out at the Front

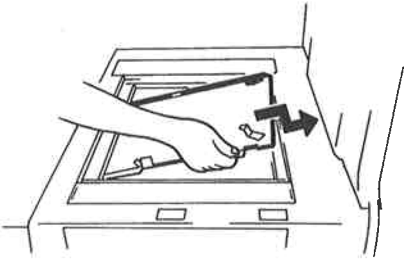


Figure 4-914

5) Disconnect the six connectors ③, and remove the nine screws ④; then, remove the laser scanner motor unit ⑤.

Caution:
The laser scanner motor driver PCB is located under the scanner rail (front). Work with care noting the presence of the PCB and the harness found on the left of the laser scanner motor unit.

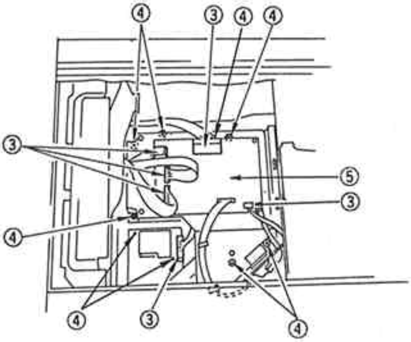


Figure 4-915

6) Open the harness retainer, disconnect the connectors ⑥ (J951, J952) on the laser driver PCB, and remove the four binding screws ⑦; then, remove the laser scanner motor controller PCB.

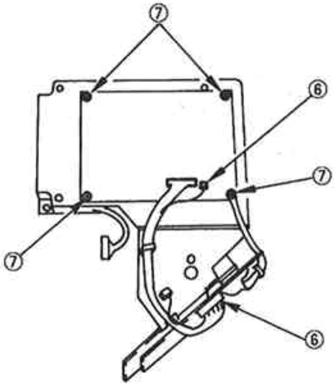


Figure 4-916

Caution:
When replacing the laser scanner unit, hold it on its metal plates and mold members, while *avoiding contact with the laser scanner controller PCB, laser scanner drive PCB, and the lens assembly*. In addition, when replacing the laser scanner controller PCB, do NOT touch any of its elements.

9. Detaching the Main Motor Driver PCB

1) Remove the rear cover.
2) Remove the four screws ①, and disconnect the four connectors ②; then, remove the main motor driver PCB ③.

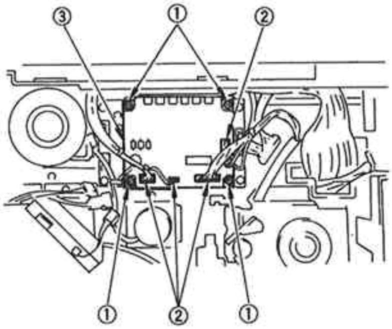


Figure 4-917

10. Detaching the Scanner Motor Driver PCB

1) Remove the main motor driver PCB, and remove the rear cover.
2) Remove the main motor driver PCB, remove the four screws ①, and disconnect the three connectors ②; then, remove the scanner motor driver PCB ③.

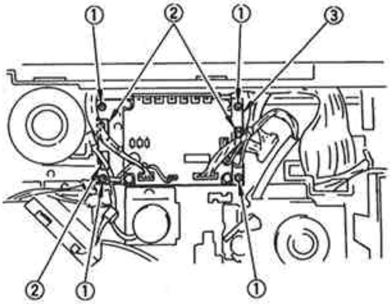


Figure 4-918

X. EDITOR

1. Removing the Editor Controller PCB

1) Remove the six face stickers ① used to hide screws.

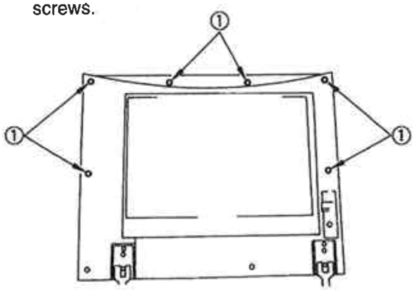


Figure 4-1001

2) Remove the two M8x8 screws, six M8x10 screws, and six M8x23 screws, 14 in total; then, remove the copyboard cover.
3) Remove the two screws ②, and remove the controller PCB cover ③.

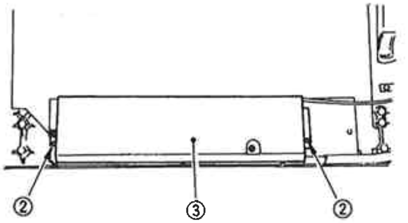


Figure 4-1002

4) Disconnect the two connectors ④, and remove the four screws ⑤; then, remove the flat cable ⑥, and remove the editor controller PCB ⑦.

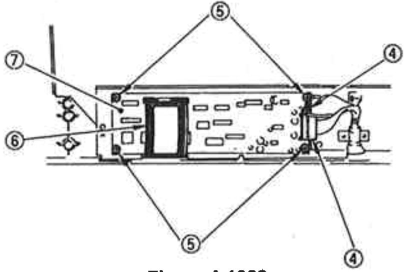


Figure 4-1003

Caution:
When attaching the controller PCB, make sure switches ① and ② are correctly positioned by referring to the settings noted on the cable.

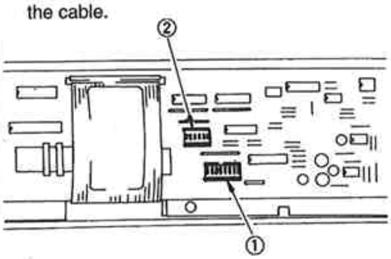


Figure 4-1004

2. Detaching the Editor Mirror

1) Remove the six stickers used to hide screws.
2) Remove the two M8x8 screws, six M8x10 screws, and six M8x23 screws, 14 in total; then, remove the copyboard cover.
3) Remove the two screws, and remove the controller PCB cover.
4) Remove the flat cable ①, and remove the five screws ②; then, remove the controller PCB support plate ③.
5) Remove the mirror plate ④.

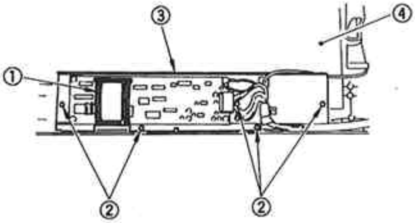


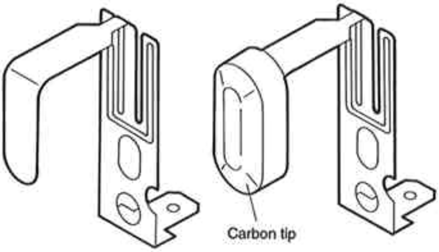
Figure 4-1005

XI. OTHERS

A. Developing Drive Assembly/Developing Assembly

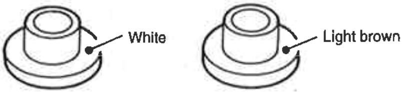
Go through the steps shown below if poor contact, or development faults caused by such contact, is noted between the developing assembly drive unit and the high-voltage supply unit.

If the parts indicated are old types, replace them with new types.



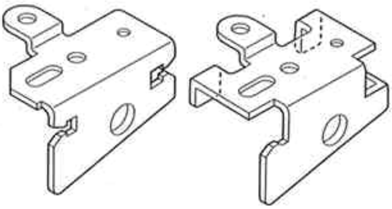
(old, FB2-0337-020) (new, FF5-4065-000)

Figure 4-1101 Developing Drive Unit Electrode



(old, FB2-0305-000) (new, FB3-7681-000)

Figure 4-1102 Developing sleeve Slider



(old, FB2-0370-000) (new, FB2-0370-020)

Figure 4-1103 Developing Assembly Fixing Plate

1. Replacing the Developing Drive Unit Electrode

Before starting the following work, be sure to disconnect the power plug.

1) Remove the developing assembly drive unit from the copier.
2) Remove one screw each, and remove the developing drive unit electrode.

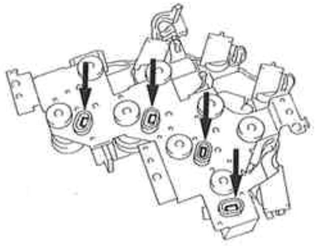


Figure 4-1104

3) Remove the conducting grease sticking to the inner side of the connector housing with a cotton wad moistened with alcohol.

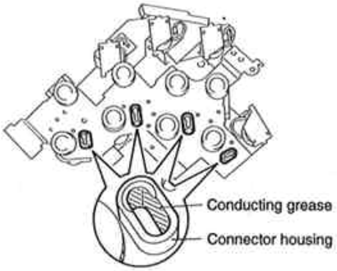


Figure 4-1105

4) Install the new electrode to the developing drive unit.
5) Install the developing drive unit to the copier, and assemble all the parts you have removed.

2. Replacing the Sleeve Slider

Before starting the following work, be sure to disconnect the power plug.

1) Open the front door and open the hopper unit.
2) Remove the screw, and remove the developing assembly.
3) If conducting grease is found at the rear of the developing sleeve, remove it with a cotton wad moistened with alcohol.

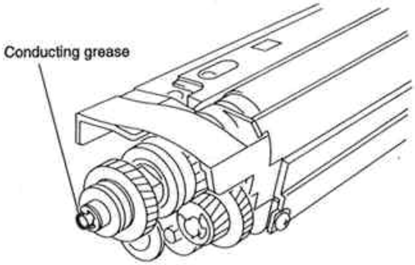


Figure 4-1106

4) Remove the E-ring, and replace the sleeve slider at the rear of the developing sleeve.

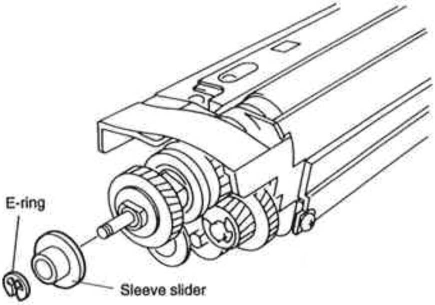


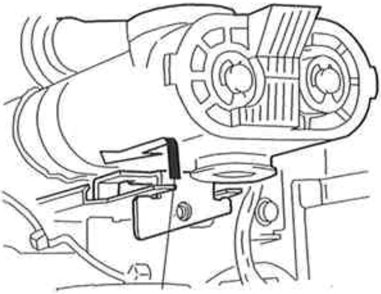
Figure 4-1107

5) Install the developing assembly.

3. Inserting the Developing Assembly (revised steps)

The shape of the developing assembly fixing plate (Figure 4-1103) has been changed to prevent improper installation.

In the new fool-proof method, the developing assembly is now forced to stop once and then inserted farther to the rear.



Lift the developing assembly, and slide it to the rear.

Figure 4-1108

B. Photosensitive Drum Cleaner Paper Sensor

1. If the photosensitive drum cleaner paper sensor unit is inserted into the machine while twisting it to the right, the mold on the sensor can damage the photosensitive drum.
   The new part is made available to prevent such damage.

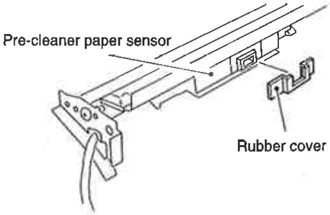


Figure 4-1109

2. If the photosensitive drum cleaner paper sensor unit is inserted into the machine at an angle, the edge of the metal plate can damage the photosensitive drum.
   The edge portion has been modified as shown in Figure 4-1110 to prevent such damage.

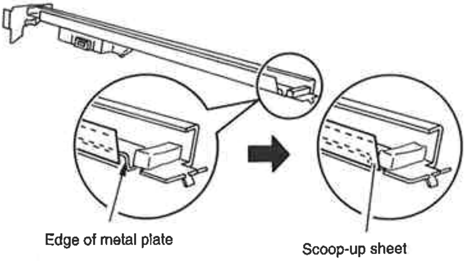


Figure 4-1110

C. Scanner Assembly

1. Removing the Laser Assembly

1) Remove the laser scanner assembly.
2) As shown, remove the laser assembly from the laser scanner unit (3 screws, 2 connectors, 1 locking support)

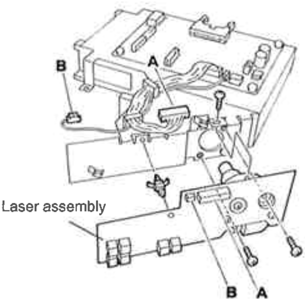


Figure 4-1111

Caution:
When handling the laser assembly, hold it as shown and avoid touching the elements on the driver PCB.
In particular, do not touch the foot of the laser; otherwise, the laser can be permanently damaged by static electricity.

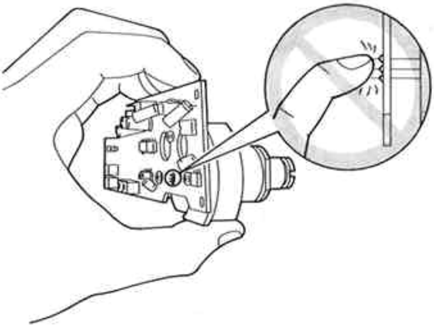


Figure 4-1112

D. Transfer Drum Unit

If the transfer drum separation claw becomes soiled with toner, the images on copies or the back of copies (center in feeding direction) can become soilde.

If such a problem is noted, or when replacing the transfer sheet, add a guide plate to the transfer sheet push-up solenoid to change the stroke of the solenoid.

1) Remove the transfer drum from the copier.
2) Peel off the transfer sheet from the trasfer drum.
3) With the separation claw plate (upper) kept down, remove the two screws, and remove the transfer push-up solenoid.

Caution:
At this time, the screwdriver will not be perpendicular to the screw head; be sure to turn it carefully. (You need not remove the harness of the solenoid.

4) Remove the tension spring, and remove the plunger (core) of the solenoid.

5) After removing the plunger, install the solenoid to the trasfer drum.
6) Install the new spring so that its side with the smaller hook diameter is toward the push-up lever.

Caution:
Take care not to deform the hook portion of the tension spring when removing and installing it.

7) With the pin fitted inside the plunger in the hole of the guide plate, put the plunger into the solenoid. (At this time, the plunger is oriented 180° opposite its initial orientation.)
8) Fix the guide plate to the solenoid with two screws (M3x4).
9) Hook the tension spring on the pin position of the plunger.
10) Attach the transfer sheet to the transfer drum, and put the transfer drum back in the copier.

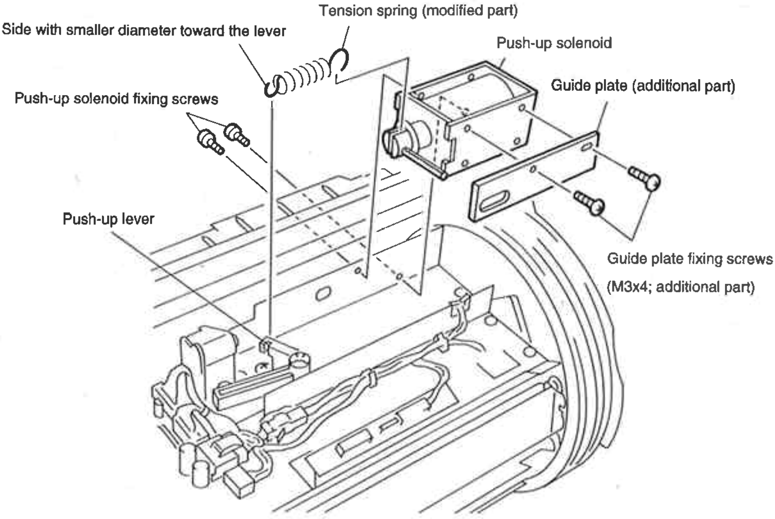

Tension spring (modified part)
Side with smaller diameter toward the lever
Push-up solenoid
Guide plate (additional part)
Push-up solenoid fixing screws
Push-up lever
Guide plate fixing screws
(M3x4; additional part)

Figure 4-1113

Caution:
A serial number of each transfer drum unit is indicated on the white label attached to the rear of the transfer drum in 6 digits; the measures being discussed have already been implemented in drum units with No. 227502 or later.

E. Removing /Replacing the Spring Clutch

Caution:
Some spring clutches are paint-locked. Remove the glue before starting the work.

1. Duplexing Unit Spring Clutch

1) Open the lower door on the left and the right, and slide out the duplexing unit.
2) Loosen the hex screw with a hex key, and remove the spring clutch.

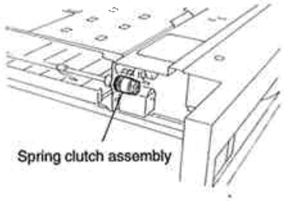


Figure 4-1114

3) Clean the shaft on which the spring clutch assembly was found with alcohol.
4) Loosen the hex screw on the new spring clutch.
5) Fit the shaft and the D-cut of the spring clutch boss, and engage the new spring clutch assembly and the shaft.
6) Put a transparency cut to an appropriate width between the spring clutch and the E-ring, and tighten the hex screw while butting the spring clutch against the E-ring.

2. Registration Roller Releasing Spring Clutch

1) Remove the fixing assembly from the transfer frame, and remove the transfer frame from the copier.
2) Remove the solenoid plate (1 tension spring), and loosen the hex screw with a hex key, and remove the spring clutch.

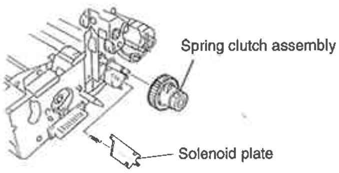


Figure 4-1115

3) Clean the shaft on which the spring clutch was found with alcohol.
4) Loosen the hex screw on the new spring clutch.
5) Install the new spring clutch to the shaft. At this time, put two transparencies cut to an appropriate width between the spring clutch assembly and the E-ring, and install the spring clutch while butting it against the E-ring. When tightening the hex screw, be sure that the D-cut of the screw and the shaft are perpendicular.

Caution:
Be sure not to leave out the work of putting transparencies between parts so that a gap will be provided ensuring correct operation of the spring clutch.

3. Attraction Push-On Unit Spring Clutch

1) Remove the attraction push-on roller unit.
2) Using a hex key, loosen the hex screw, and remove the spring clutch from the rear of the registration roller assembly.

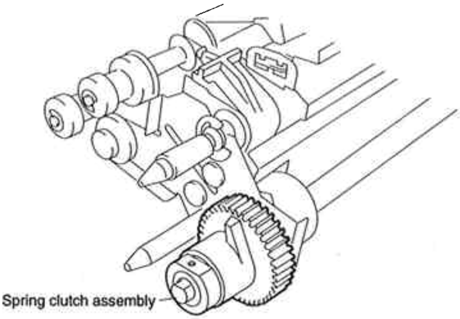


Figure 4-1116

3) Clean the shaft on which the spring clutch was found with alcohol.
4) Loosen the hex screw of the new spring clutch.
5) Install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring.
   Further, when tightening the hex screw, be sure that the screw and the D-cut of the shaft are perpendicular.

Caution:
Be sure not to leave out the work of putting transparencies between parts so that a gap will be provided ensuring correct operation of the spring clutch.

4. Transfer Cam Assembly Spring Clutch

1) Remove the rear cover, and open the DC controller PCB, and remove the support plate as shown in Figure 4-1119.
2) Remove the solenoid.
3) Remove the two screws, and remove the stopper.
4) Using a hex key, loosen the two hex screws, and remove the spring clutch.

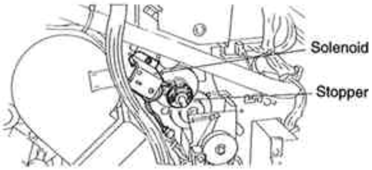


Figure 4-1117

5) Clean the shaft on which the spring clutch was found with alcohol.
6) Install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring.

Caution:
When tightening the hex screws, keep the hole of the shaft facing up, and fit and tighten the screws in 9 and 12 o'clock direction.

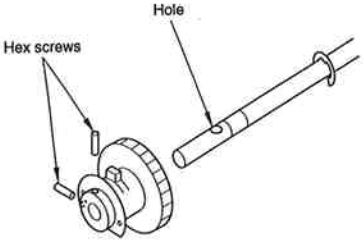


Figure 4-1118

If the new spring clutch is of a large diameter, you need not use a transparency; butt the spring clutch directly to the E-ring when installing it.

7) Install the spring clutch assembly while turning the stopper fully to the right.

> **Caution:**
> You must use a transparency to ensure the proper operation of the spring clutch by creating a gap. (You need not create a gap, however, if the spring clutch is of a large diameter.)

5. Transfer Drum Cleaner Spring Clutch

1) Remove the rear cover.
2) Open the DC controller PCB, and remove the support plate.

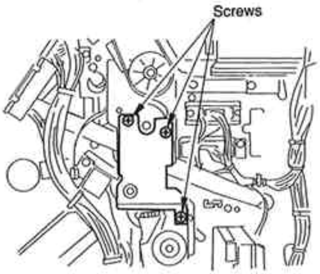


Figure 4-1119

3) Remove the drive belt; then, remove the two screws, and remove the support plate.

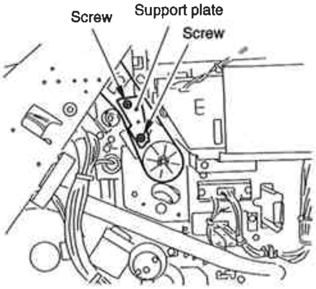

Screw
Support plate
Screw

Figure 4-1120

4) Disconnect the connector; then, remove the two screws, and remove the transfer cleaner drive assembly.

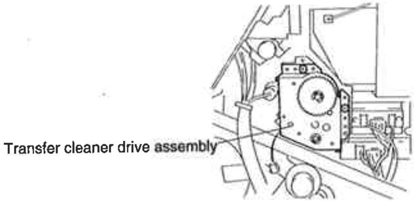

Transfer cleaner drive assembly

Figure 4-1121

5) Remove the screw, and remove the solenoid.
6) Remove the E-ring, washer, and bearing.

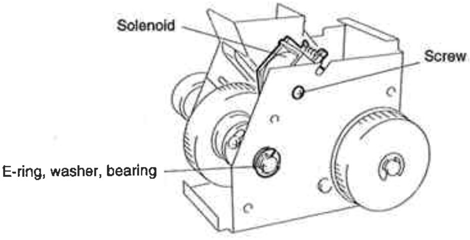

Solenoid
Screw
E-ring, washer, bearing

Figure 4-1122

7) Remove the two screws, E-ring, and bearing; then, divide the transfer cleaner drive assembly into two.

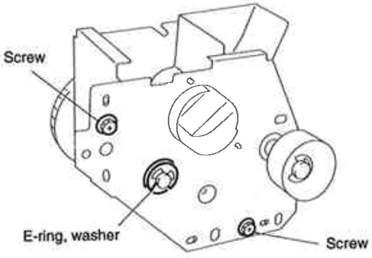

Screw
E-ring, washer
Screw

Figure 4-1123

8) Remove the two screws, and remove the stopper.

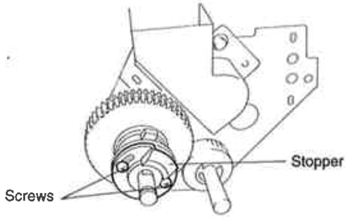


Figure 4-1124

9) Using a hex screw, loosen the two hex screws, and remove the spring clutch assembly.

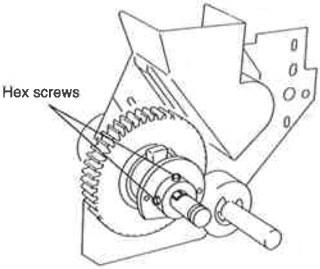


Figure 4-1125

10) Clean the shaft with alcohol.
11) Remove the stopper from the new spring clutch, and install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring.

Caution:
When tightening the hex screws, keep the hole of the shaft facing up, and fit and tighten the screws in 9 and 12 o'clock direction.

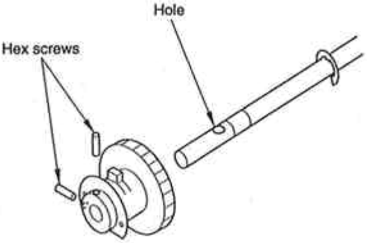


Figure 4-1126

If the new spring clutch is of a large diameter, you need not use a transparency; butt the spring clutch directly to the E-ring when installing it.

12) Remove the transparency, and install the spring clutch with the stopper turned fully to the right.

6. Developing Assembly Locking Unit Spring Clutch

1) Remove the developing assembly drive unit.
2) Using the hex key, loosen the hex screw; then, remove the developing drive unit spring clutch.
3) Clean the shaft on which the spring clutch was found with alcohol.
4) Loosen the hex screw on the new spring clutch.

5) Install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring (If the new spring clutch is of a large diameter, you need not use a transparency; butt the spring clutch directly to the E-ring when installing it.). At this time, tighten the hex screw while keeping the shaft in place and turning the boss clockwise.

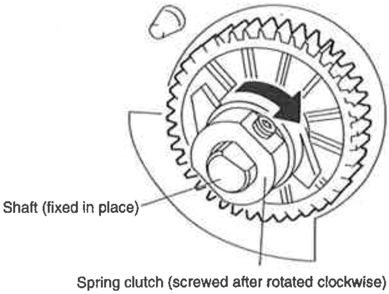


Figure 4-1127

Caution:
Be sure not to leave out the work of putting transparencies between parts so that a gap will be provided ensuring correct operation of the spring clutch. (You need not create a gap, however, if the spring clutch is of a large diameter.)

XII. STANDARDS AND ADJUSTMENTS

A. Mechanical

1. Non-Image Width

Make sure that the non-image width at the time of DIRECT with document detection off is as follows:

leading edge:	8.0 ±1.5 mm	(8.0 ±2.0 mm)
left/right:	2.0 ±1.0 mm	(2.0 ±1.5 mm)
trailing edge:	4.5 mm	(4.5 mm)

The value in parentheses refers to the 2nd side of a two-sided copy.

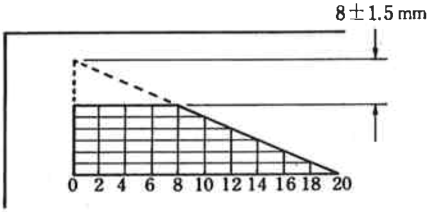


Figure 4-1201 Leading Edge Non-Image Width

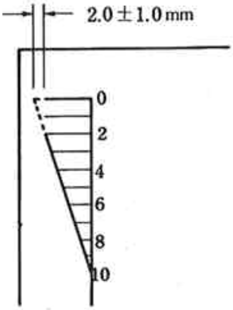


Figure 4-1202 Left/Right Non-Image Width

2. Image Margin

Make sure that the image margin at the time of DIRECT with document detection off is as follows:

leading edge:	8.0 ±1.5 mm	(8.0 ±2.0 mm)
left/right:	2.0 ±1.0 mm	(2.0 ±1.5 mm)
trailing edge:	4.5 ±1.5 mm	(4.5 ±2.0 mm)

The value in parentheses refers to the 2nd side of a two-sided copy.

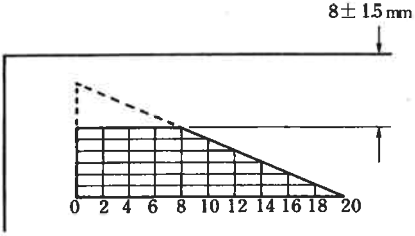


Figure 4-1203 Leading Edge Image Margin

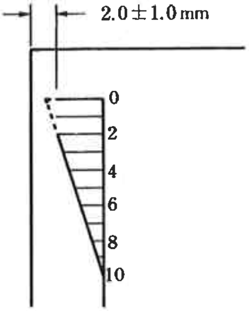


Figure 4-1204 Left/Right Image Margin

3. Checking and Adjusting the Non-Image Width and Margin

Make checks/adjustments in the order indicated:

- left-right registration adjustment
- retention position adjustment (ATTRACT)
- image margin adjustment (TR-DELAY)
- image read start position adjustment (ADJ-XY)
- image margin check

a. Adjusting the Left/Right Registration

1) Make 10 copies each from all the cassettes, multifeeder, and duplexing unit, and check the margin on left/right.
2) If the margin is outside the specification, adjust as follows:

- Pick-Up from the Cassette

1) Remove the cassette from the holder you want to adjust.
2) Turn the adjusting screw 1 to adjust the horizontal registration plate so that the horizontal registration on the copy image is 2 ±1 mm.

To increase the registration at the front,

↓

Turn the adjusting screw counterclockwise (a single turn will lead to a change of about 0.7 mm).

To increase the registration at the rear,

↓

Turn the adjusting screw clockwise (a single turn will lead to a change of about 0.7 mm).

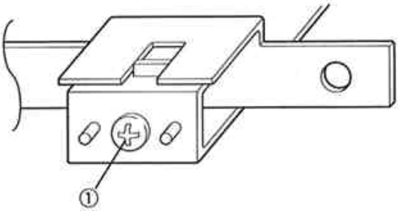


Figure 4-1205a

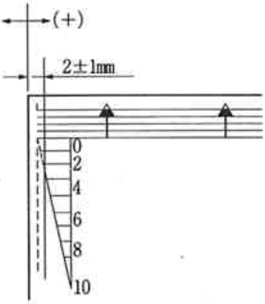


Figure 4-1205b

- Pick-Up from the Multifeeder
  Loosen the screw ①, and move the tray until 0 ±1.5 mm is met in DIRECT.

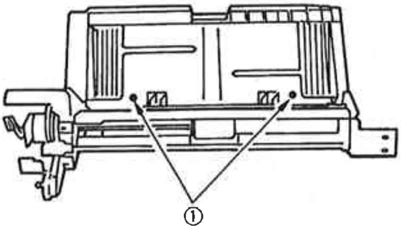


Figure 4-1206

- Two-Sided Copies
  Loosen the screw ①, and move the paper jogging guide plate until 0 ±1.5 mm is met in DIRECT.

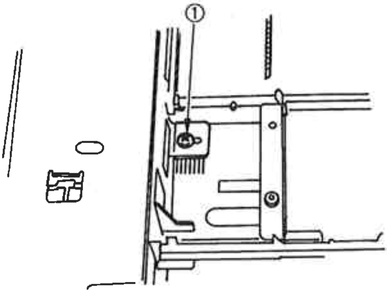


Figure 4-1207

b. Adjusting the Point of Retention (ATTRACT)

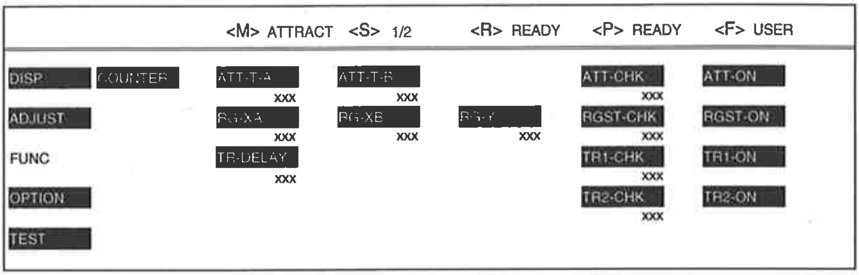

<M> ATTRACT <S> 1/2
<R> READY
<P> READY
<F> USER
DISP
COUNTER
ATT-T-A
xxx
ATT-T-B
xxx
ATT-CHK
xxx
ATT-ON
ADJUST
RG-XA
xxx
RG-XB
xxx
RG-Y
xxx
RGST-CHK
xxx
RGST-ON
FUNC
TR-DELAY
xxx
TR1-CHK
xxx
TR1-ON
OPTION
TR2-CHK
xxx
TR2-ON
TEST

Figure 4-1208

1) Activate service mode.
2) Select 'FUNC'.
3) Select 'ATTRACT'.
4) Press 'ATT-CHK', and set it to '1', i.e., double-side retention of side B and side A.
5) Press 'ATT-ON.
   - Copy paper is picked up, retained, and stopped.
6) Pull out the transfer assembly frame.
7) Place a ruler or copy paper on the marking (Figure 4-1209) made in the transfer drum ring (front, rear), and measure point 'd' along the leading edge of the copy paper in relation to the marking. Take measurements for both side A and side B.

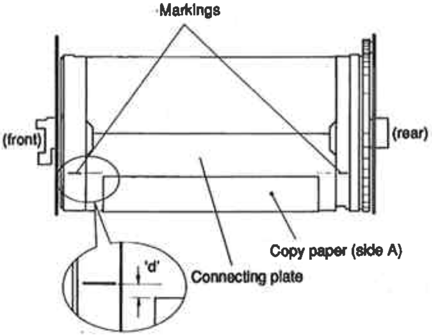

Markings
(front)
(rear)
'd'
Copy paper (side A)
Connecting plate

Figure 4-1209

8) For side A, select 'ATT-T-A' and for side B, select 'ATT-T-B'; then, make adjustments so that 'd' is 0 ±0.5 mm.
   - A change by '1' for 'ATT-T-A' or 'ATT-T-B' changes the point of retention by about 0.1 mm.
   - A higher setting *delays* the point of retention for copy paper (➡ direction); on the other hand, a lower setting *advances* the point of retention for copy paper (➡ direction).

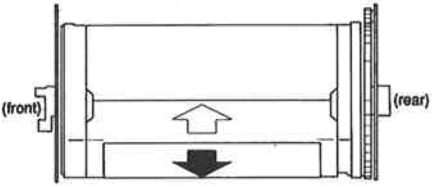


Figure 4-1210

9) After adjustment, turn the power switch off and then on.
   - You must turn the power switch off and then on, or the copy will not carry any image.

c. Adjusting the Image Leading Edge Margin (RG-XA, RG-XB)

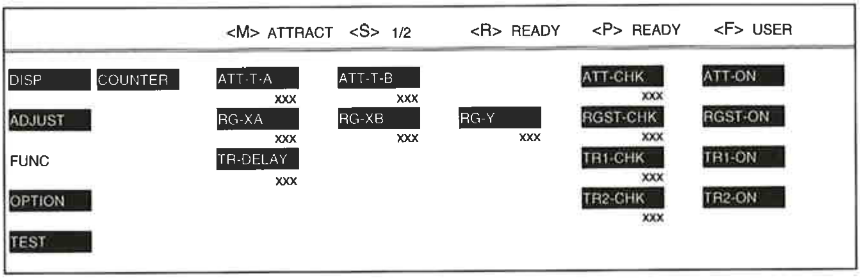
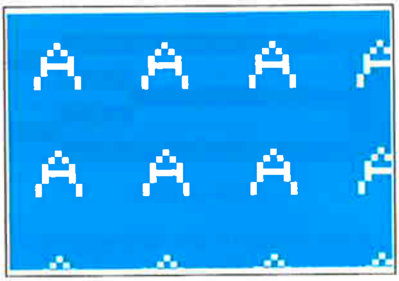
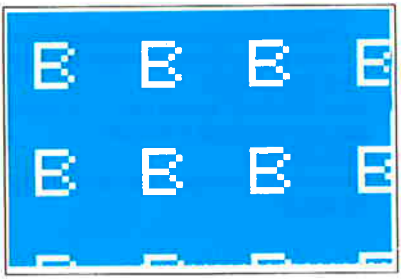

<M> ATTRACT
<S> 1/2
<R> READY
<P> READY
<F> USER
DISP
COUNTER
ADJUST
FUNC
OPTION
TEST
ATT-T-A
xxx
ATT-T-B
xxx
RG-XA
xxx
RG-XB
xxx
RG-Y
xxx
TR-DELAY
xxx
ATT-CHK
xxx
RGST-CHK
xxx
TR1-CHK
xxx
TR2-CHK
xxx
ATT-ON
RGST-ON
TR1-ON
TR2-ON

Figure 4-1211

1) Activate service mode, and select 'ATTRACT' under 'FUNC' in service mode.
2) Press 'RGST-CHK', and set it to '1', i.e., double-side retention of side B and side A.
3) Press 'RGST-ON'.
   - A total of two test prints will be generated (Figure 4-1212).



Output of side A



Output of side B

Figure 4-1212

4) Measure the leading edge margin 'd' on the prints; take measurements on both side A and side B.

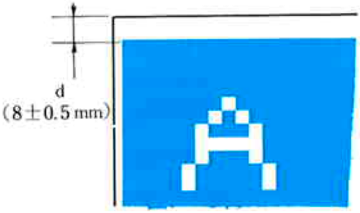
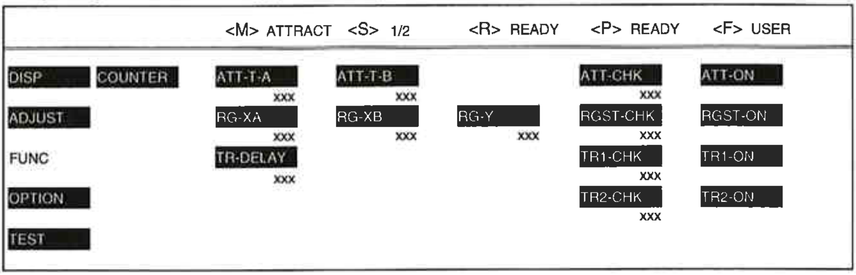


Figure 4-1213

5) For side A, select 'RG-XA' and for side B, select 'RG-XB'; then, make adjustments until d is 8 ±0.5 mm.
   - A change by '1' changes the leading edge margin by about 0.1 mm.
   - A higher setting increases the leading edge margin; a lower setting, on the other hand, decreases the leading edge margin.

d. Adjusting the Transfer Delay (TR-DELAY)



<M> ATTRACT <S> 1/2 <R> READY <P> READY <F> USER

DISP COUNTER ATT-T-A xxx ATT-T-B xxx ATT-CHK xxx ATT-ON

ADJUST RG-XA xxx RG-XB xxx RG-Y xxx RGST-CHK xxx RGST-ON

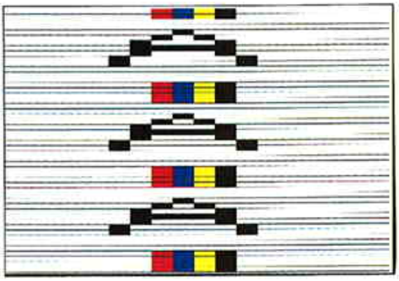
FUNC TR-DELAY xxx TR1-CHK xxx TR1-ON

OPTION TR2-CHK xxx TR2-ON

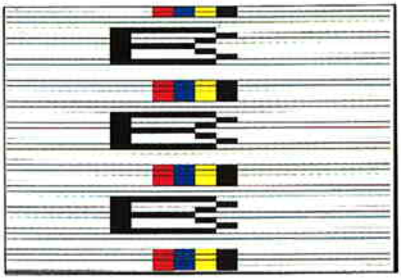
TEST

Figure 4-1214

1) Activate service mode, and select 'ATTRACT' under 'FUNC'.
2) Press 'TR1-CHK', and set it to '1', i.e., double-side retention for side B and side A.
3) Press 'TR1-ON'.
   - A total of two test prints will be generated.



Test Print of Side A



Test Print of Side B

Figure 4-1215

4) Measure the transfer delay 'd' on the generated image of side B.

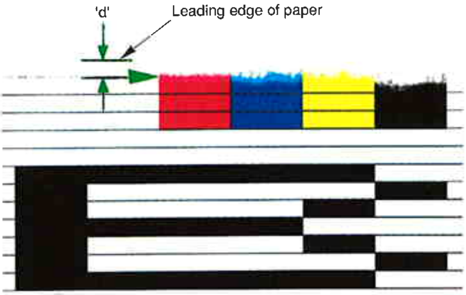


Figure 4-1216

5) Select 'TR-DELAY', and make adjustments by changing the setting so that d is 3 ± 0.5 mm.
   - A change by '1' changes the transfer delay by about 0.1 mm.
   - A higher setting increases the transfer delay; a lower setting, on the other hand, decreases the transfer delay.
6) Press 'TR2-CHK', and set it to '1', i.e., double-side retention of side B and side A.
7) Press 'TR2-ON'.
8) Check the leading edge margin (8 ± 0.5 mm) on the printout.

e. Adjusting the Image Read Start Position(ADJ-XY)

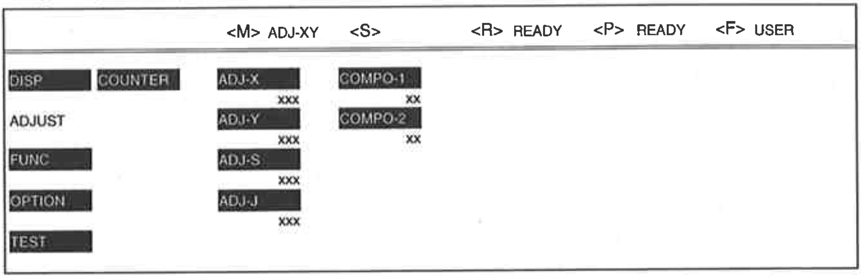

<M> ADJ-XY
<S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
ADJUST
FUNC
OPTION
TEST
ADJ-X
xxx
ADJ-Y
xxx
ADJ-S
xxx
ADJ-J
xxx
COMPO-1
xx
COMPO-2
xx

Figure 4-1217

1) Activate service mode, and select 'ADJ-XY' under 'ADJUST'.
2) Press the Copy Start key while the ADJ-XY screen is displayed.
   - The appropriate copy mode is set automatically, and a copy is made with a shift of about 50 mm as shown in Figure 4-1218.
3) If the part of the image is missing, decrease the setting of 'ADJ-X' and 'ADJ-Y'.
4) If the image includes areas outside the image area, increase the setting of 'ADJ-X' and 'ADJ-Y'.
5) Press the Copy Start key once again, and check.
6) Press the Reset key.

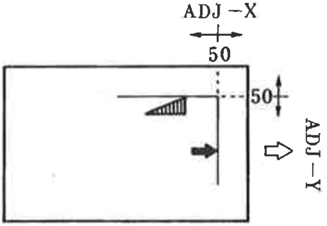

ADJ −X
50
50
ADJ −Y

Figure 4-1218

4 Changing the Image Trailing Edge Margin

The standard for the image trailing edge margin is 4.5 ±1.5 mm. If the user requests a change, the trailing edge margin may be adjusted to 2.5 ± 1.5 mm after satisfying the conditions given under a.

a. Conditions

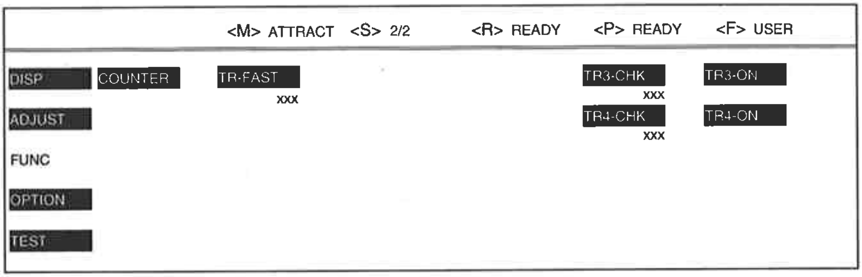
Make sure of the following to avoid drum memory caused by moist copy paper in a high-humidity environment:

- Install the cassette heater.
- Advise the user to prohibit the use of most paper.
- Advise the user to prohibit the use of the cassette 1 for Hammermill paper.
- Keep in mind that the trailing edge margin will be fixed to 4.5 mm for copies made in manual feeding or for the first side of a two-sided copy.

b. Steps

1) For the special transfer timing, see c.
2) For setting the trailing edge margin to 2.5 mm, see d.

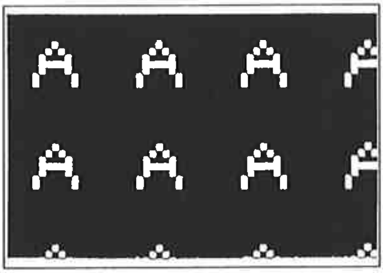
c. Adjusting the Special Transfer Timing



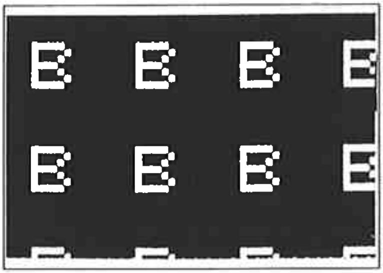
```
                        <M> ATTRACT  <S> 2/2       <R> READY    <P> READY    <F> USER

DISP      COUNTER      TR-FAST                                  TR3-CHK      TR3-ON
                           xxx                                      xxx
ADJUST                                                          TR4-CHK      TR4-ON
                                                                    xxx
FUNC

OPTION

TEST
```

Figure 4-1219a

1) Activate service mode, and select 'ATTRACT' under 'FUNC'; then, press the Interrupt key.
2) Press 'TR-3CHK', and set it to '1' (2-sheet attraction mode; side A and side B).
3) Press 'TR-3ON.
   - A total of two print-outs will be generated (one each of the following).



Output of side A



Output of side B

Figure 4-1219b

4) Using the print-out of side B, measure the trailing edge transfer special timing length d.

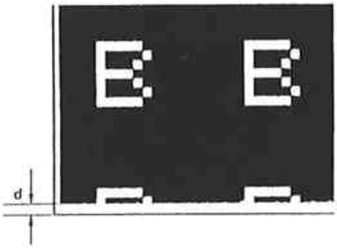


Figure 4-1219c

5) Select 'TR-FAST', and change the setting so that the d measured in step 4) will be 2.0 ± 0.5 mm.
   settings: -127 to 127
   unit: 0.1mm (A higher setting will result in a lower d.)
6) Press 'RGST-CHK' under 'ATTRACT', set the item to '1' (2-sheet retention for B-/A-side).
7) Press 'RGST-ON' under 'ATTRACT'. (An image with a trailing edge margin of 4.5 mm will be generated.)
8) Check to make sure that the trailing edge of the printed image is not blurred.

d. Setting the Trailing Edge Margin to 2.5 mm

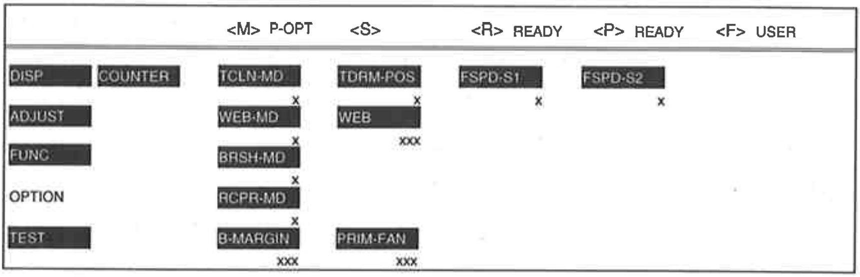

<M> P-OPT
<S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
TCLN-MD
TDRM-POS
FSPD-S1
FSPD-S2
x
x
x
x
ADJUST
WEB-MD
WEB
x
xxx
FUNC
BRSH-MD
x
OPTION
RCPR-MD
x
TEST
B-MARGIN
PRIM-FAN
xxx
xxx

Figure 2-1219d

1) Press 'B-MARGIN' under 'OPTION' in service mode.
2) Set 'B-MARGIN' to '1'.
   0: trailing edge margin 4.5 mm
   1: trailing edge margin 2.5 mm
3) Select 'ATTRACT' in service mode, and press the Interrupt key.
4) Press 'TR-4CHK', and set it to '1' (2-sheet attraction mode; side B and side B).
5) Press 'TR-4ON'.
   - Check to make sure that the trailing edge margin of the printed image is 2.5 mm.

Caution:

The same level of high voltage for transfer is for both normal and special transfer regardless of the setting of 'B-MARGIN' of 'P-OPT' under 'OPTION'.

To reset the trailing edge margin from 2.5 mm to 4.5 mm, you must make the necessary changes for special transfer timing in addition to changing '1' to '0' for 'B-MARGIN' of 'P-OPT' under 'OPTION'. Failure to do so can lead to drum memory.

5. Installing the Photosensitive Drum

1) Put drum cleaner lubricant evenly along the No. 2 blade of the black toner density sensor.

Caution:
1. Be sure to mix the lubricant well by shaking its container before application.
2. Be sure to apply the lubricant to both sides (A and B) as well as the edges of the blade.
3. Do not rub in the lubricant, or the edge may chip; apply as if to tap on the edge.

2) Apply the drum cleaner lubricant evenly over the blade in the photosensitive drum cleaning assembly.

Caution:
1. You need not perform the step if you have replaced the cleaning blade. Blades available as service parts are pre-coated with lubricant.
2. Shake the lubricant well before application.
3. Apply to sides A and B as well as the edge of the blade.
4. Do not apply as if to rub in the lubricant, or you could chip the edge; tap lightly.
5. If the application is not even, the copies may carry white vertical lines.

3) Dry-wipe the surface of the black toner density sensor.

Caution:
1. Do not use alcohol.
2. Take care not to touch the photosensitive drum.

4) Hold both ends of the photosensitive drum, and put it carefully into the unit along the guide rail ① of the photosensitive drum unit.

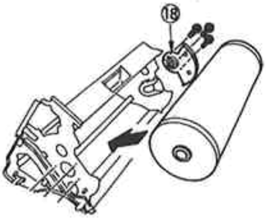
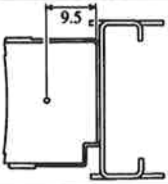
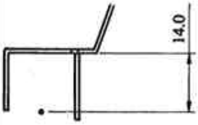
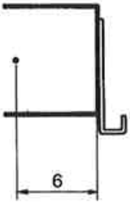


Figure 4-1219

5) Fix the butting block (front, rear) with six screws.
6) Install the photosensitive drum unit to the copier.
7) Connect the connector of the black density sensor, and install the photosensitive drum cleaner and primary corona assembly.
8) Replace the black developer.
9) Execute 'INIT-K' under 'INSTALL' under 'FUNC' of service mode to store the toner density data.
10) Execute auto gradation correction in user mode.

6. Height of the Corona Wires

Corona unit	Height of corona wire (mm)	Adjustable (mm; approx.)
Primary corona unit		4
Separation corona unit		4
External static eliminator corona unit		4

Note:
The height of each corona wire can be adjusted by turning the screw behind the corona unit; a full turn of the screw changes the position of the corona wire by about 0.7 mm.
*However, you cannot adjust the height of the transfer charging assembly, internal static eliminating assembly, or retention assembly.

7. Replacing the Developer

1) Open the front door (left, right), and remove the two screws ①; then, remove the hopper unit stopper fixing.

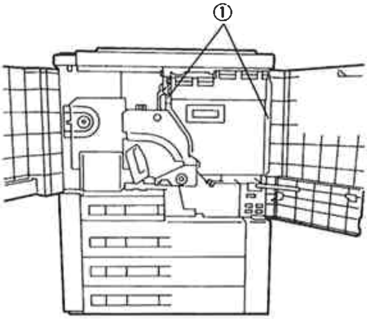


Figure 4-1220

2) Fully open the hopper unit.
3) Remove the cap ② from the outlet found at the bottom front of the developing assembly whose developer you want to replace.
   Place a plastic bag ③ or the like to receive developer; a fair amount of developer will fall out of the developing assembly.

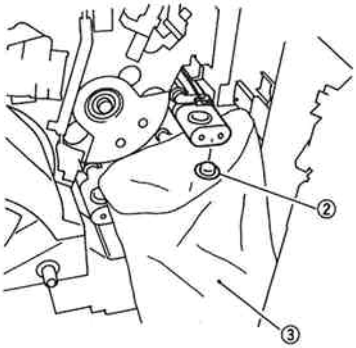


Figure 4-1221

4) Elect 'INSTALL' under 'FUNC' in service mode.
5) While holding a plastic bag over the outlet, press 'RECV-M/C/Y/K' according to the color of the developer you are replacing.
   - Stop the operation by pressing the Stop key (▼) when the developer stops pouring.
6) Attach the cap to the outlet.
7) Remove the screw, and remove the developing assembly; then, remove the cap from the outlet.
   - If you are removing Bk developing assembly, disconnect the connector.
8) While tilting the developing assembly, turn the gear by hand to pour out the developer.
   At this time, tilt the developing assembly further as you turn the gear until the developing assembly is fully upright and all developer has fallen out.

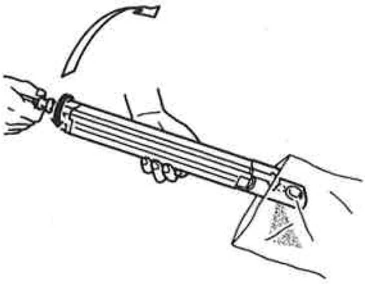


Figure 4-1222

9) Attach the cap to the outlet.
10) Install the developing assembly to the copier.
11) When the machine has completed warm-up, select 'INSTALL' under 'FUNC' in service mode.
12) Press 'SPLY-M/C/Y/K' according to the color of the developer you are replacing.
13) Check that the developing assembly becomes engaged and the screw inside the developing assembly starts to rotate.

14) Fit the developer funnel (accessory) in the supply mouth of the developing assembly.

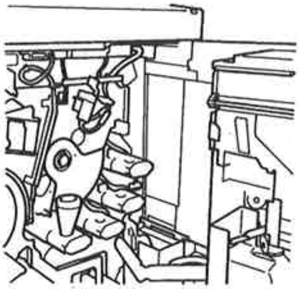


Figure 4-1223

15) Put developer into the developing assembly.
    - Tilt the container of the developer as you turn it to avoid spilling.

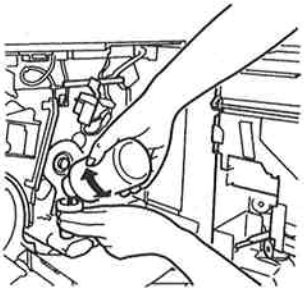


Figure 4-1224

16) When you have put all developer, press the Stop key.
17) Execute 'STIR-Y/M/C/K' in service mode. Wait until the notation of <P> on the display changes from '<P> SERVICE' to '<P> READY'.
18) Execute 'INIT-Y/M/C/K' in service mode. Wait until the notation of <P> on the display changes from '<P> SERVICE' to '<P> READY'.
19) Fill out the Service Data Sheet with ATR-related data.

8. Orientation of the Pick-Up Roller (cassette pick-up assembly, duplexing pick-up assembly)

Install the pick-up roller ① to the pick-up assembly so that the round marking ② found on its rubber portion is toward the front.

for front, use brass
for rear, use silver

Note:

for cassette pick-up assembly, gray
for duplexing unit pick-up assembly, black

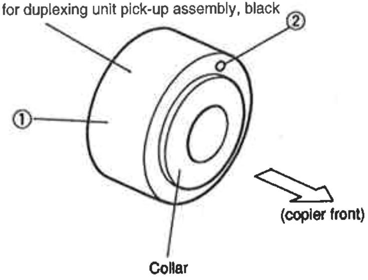
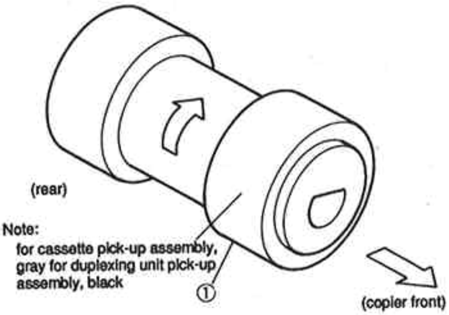


Figure4-1225

9. Orientation of the Separation Roller (cassette pick-up assembly, duplexing unit pick-up assembly)

Install the separation roller ① to the pick-up assembly so that the D-cut in the collar is toward the front.

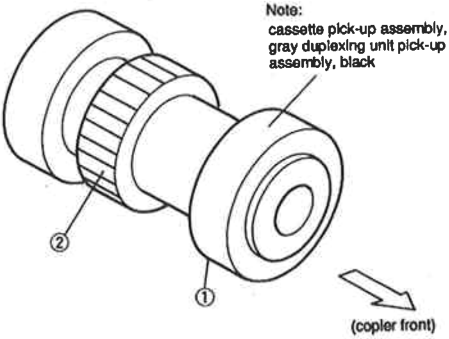


Note:
for cassette pick-up assembly, gray for duplexing unit pick-up assembly, black

Figure 4-1226

10. Orientation of the Feeding Roller (cassette pick-up assembly) and Feeding Roller 1 (duplexing unit pick-up assembly)

Install the feeding roller ① to the pick-up assembly so that the belt pulley ② attached to the separation roller is toward the rear.



Note:
cassette pick-up assembly, gray duplexing unit pick-up assembly, black

Figure 4-1227

11. Orientation of the Feeding Roller 2 (duplexing unit pick-up assembly)

Install the feeding roller 2 ① so that the round marking ② in the rubber portion is toward the front.

for front, brass
for rear, silver

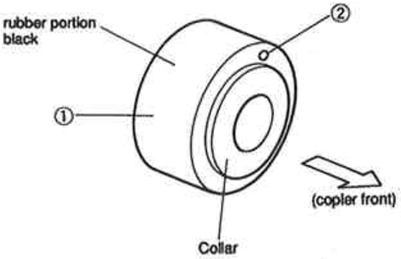


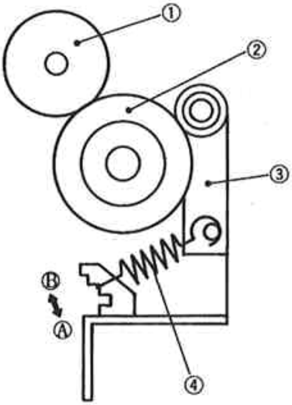
Figure 4-1228

12. Adjusting the Pressure of the Separation Roller

If double-feeding or pick-up failure occurs during pick-up operation, adjust the position of the pressure spring of the separation roller.

① If double-feeding occurs, move the spring hook in the direction of arrow Ⓐ.

② If pick-up failure occurs, move the spring hook in the direction of arrow Ⓑ.



① Feeding roller
② Separation roller
③ Pressure lever
④ Pressure spring

Figure 4-1229

13. Positioning the Pick-Up Assembly Pick-Up Roller Releasing Solenoid (SL16, SL17, SL18, SL19)

Install the solenoid so that the roller arm ① shown in Figure 4-1229 butts against the upper stay ② when the solenoid plunger is pushed in.

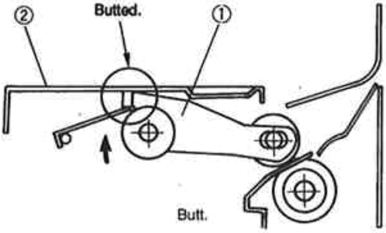


Figure 4-1230

14. Orientation of the Multifeeder Pick-Up Roller

Install the multifeeder pick-up roller ① so that the side with the collar marked with a cross ② is toward the rear.

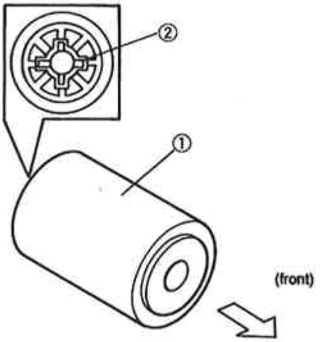


Figure 4-1231

15. Position of the Multifeeder Assembly Paper Guide Plate Cam

Adjust the engagement of the 26T gear 1 and 26T gear 2 so that the paper guide plate and paper guide plate cam are positioned as shown in Figure 4-1231 when the solenoid plate is in contact with the claw of the control ring.

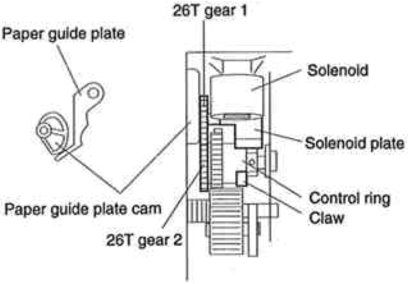


Figure 4-1232

16. Attaching the Timing Belt in the Multifeeder Assembly

Butt the rack plate of the multifeeder against A (open state).

Move the slide volume in the direction of B, and attaching the timing belt to the pulley.

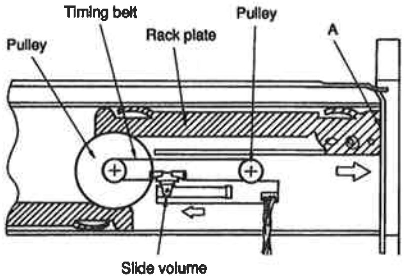


Figure 4-1233

17. Adjusting the Pressure of the Multifeeder Assembly Separation Pad

If double-feeding or pick-up failure occurs during pick-up operation, adjust the position of the separation pad pressure spring.

① If double-feeding occurs, move the position of the spring holder in the direction of A.

② If pick-up failure occurs, move the position of the spring holder in the direction of B.

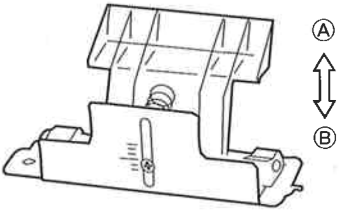


Figure 4-1234

18. Position of the Delivery Paper Deflecting Plate Drive Solenoid (SL20)

1) Place the delivery assembly upright on a level surface.

2) Loosen the adjusting screw and make adjustments so that the paper deflecting plate butts against the delivery paper upper guide when the solenoid is on (viewing the delivery assembly from the rear). (See Figure 4-1235.)

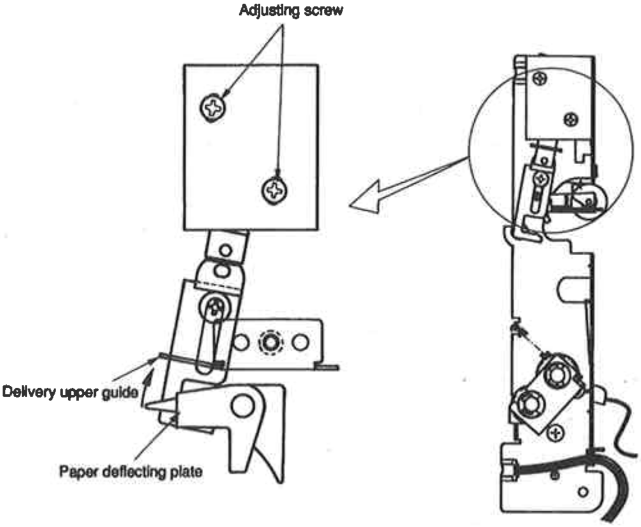

Adjusting screw
Delivery upper guide
Paper deflecting plate

Figure 4-1235

19. Routing the Scanner Drive Cable

For instructions on how to route the scanner drive cable, see Chapter 4 "Routing the Scanner Drive Cable" in the Service Manual.

Caution:
Take care not damage the wire by the edge of the metal plate.

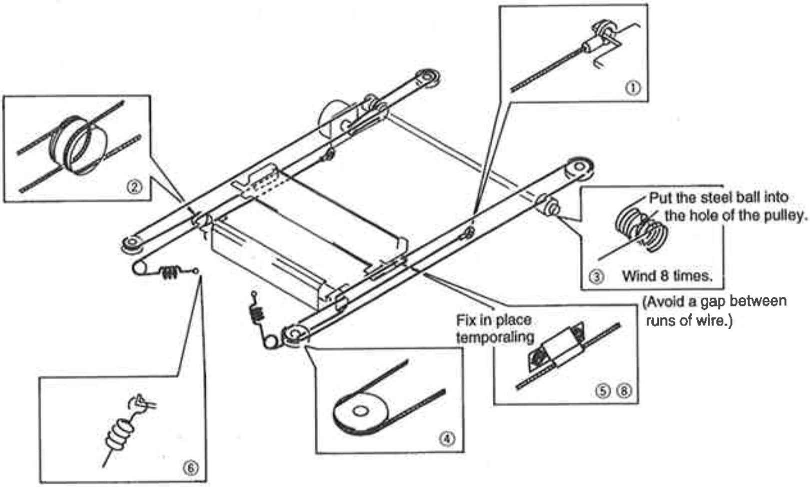
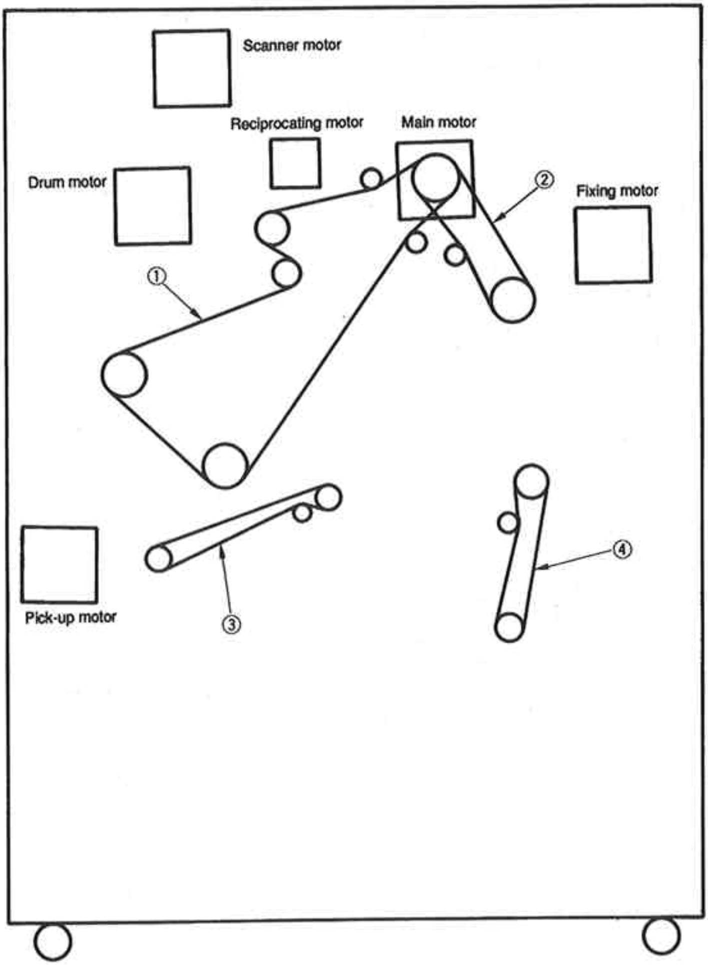

①
②
Put the steel ball into the hole of the pulley.
③ Wind 8 times.
(Avoid a gap between runs of wire.)
Fix in place temporaling
⑤ ⑧
④
⑥

Figure 4-1236

Caution:
1. Make sure that the scanner cable is free of twists and it has not ridden over the pulley.
2. Move the No. 1 and No. 2 mirror mounts by hand to make sure that they move smoothly. At this time, do not touch the reflecting plate.

20. Routing the Drive Cables

See Figure 4-1237 for how to route the drive cables.


Scanner motor
Reciprocating motor
Main motor
Drum motor
②
Fixing motor
①
④
Pick-up motor
③

① Developing assembly, registration, photosensitive drum cleaner drive cables
② Feeding assembly, delivery feeding assembly drive cables
③ Pick-up assembly drive belt
④ Duplexing unit feeding assembly drive belt

Figure 4-1237

21. Points to Note When Replacing the Fixing Heater

- Do not touch the surface of the heater.

Reference:

Both upper and lower fixing heaters are of the same type; moreover, the heaters do not have orientation (front/rear).

22. Adjusting the Nip (adjusting the nut for the fixing assembly pressure)

- The nip is correct if it is within the value shown in Table 4-1. Otherwise, turn the adjusting nut.

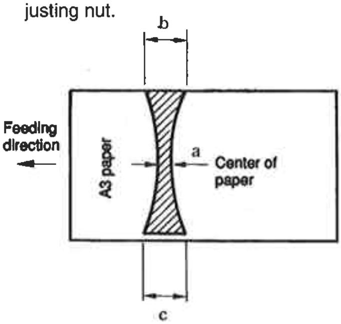


Figure 4-1238

Note:

b and c refer to points 10 through 15 mm from the edge of paper.

Dimensions	Measured when both upper and lower rollers are sufficiently heated.
a	7 ±0.5 (mm)
I b – c I	0.5 (mm) or less
b – a c – a	1 (mm) or less

Table 4-1

- Measuring the Nip Width
  If you are taking measurements while the rollers are cold, wait 15 min after standby and make 20 copies before taking measurements.
- Taking Measurements

1) Activate service mode.
2) Select 'FUSER' under 'FUNC', and press 'NIP-CHK' to execute the mode. (The operation ends when the notation of <P> changes from 'READY' to 'SERVICE' to 'READY'.)

23. Adjusting the Home Position of the Duplexing Unit Stacking Assembly Paper Jogging Plate

1) Select A4R or LTR-R; then, copy on the 1st side of a two-sided copy.
2) Slide out the duplexing unit toward the front.
3) Measure the distance L of the paper jogging plate ①.

A4R: L=210 ±0.3 mm
LTR-R: L=216 ±0.3 mm

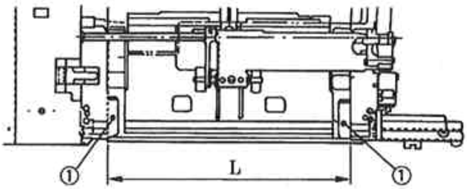


Figure 4-1239

4) If the measurement is outside the specification, remove the front cover of the holding plate.
5) Loosen the screw ②, and turn the adjusting screw ③ to adjust the position of the paper jogging guide plate home position sensor.

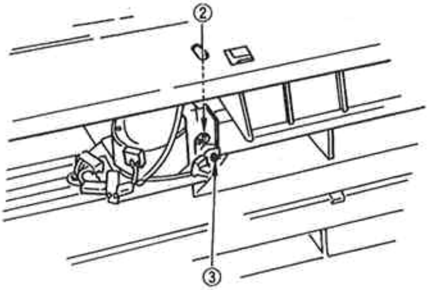


Figure 4-1240

24. Adjusting the Position of the Duplexing Unit Stacking Assembly Paper Feeding Roller Down Solenoid (SL22)

Let the feeding roller drop on its own weight to the bottom of the duplexing unit stacking assembly.

At this time, keep the plunger of the solenoid pushed, and fix the solenoid ③ in place so that the distance between the edges of the lever ① and arm ② is 1.5 ±0.5 mm.

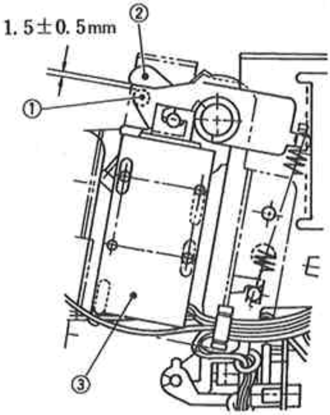


Figure 4-1241

25. Positioning the Duplexing Unit Pick-Up Assembly Pick-Up Roller Releasing Solenoid (SL21)

1) Remove the duplexing unit pick-up assembly.
2) Place the duplexing unit pick-up assembly as shown in Figure 4-1241; then, lift the lever ① so that the pick-up roller ② drops on its own weight.
3) Adjust the pick-up roller releasing solenoid (SL21) so that the length L is 65 ±1 mm.

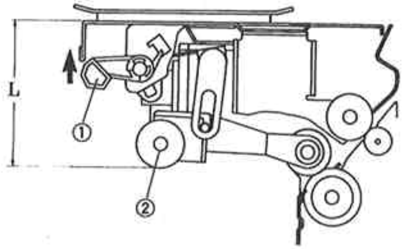


Figure 4-1242

26. Adjusting the Drive Belt for the Duplexing Unit Stacking Assembly Feeding Roller

Fix the idler mount ① while pushing it in the direction of the arrow with a force of 250 g.

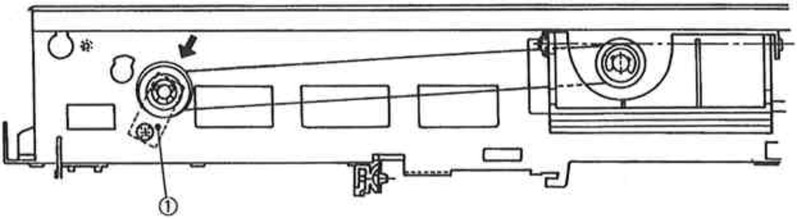


Figure 4-1243

27. Adjusting the Drive Belt for the Duplexing Unit Feeding Assembly

Fix the tension mount ① in place while pushing it in the direction of the arrow with a force of 450 ±50 g.

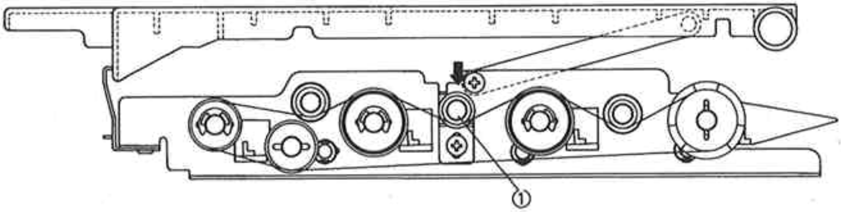


Figure 4-1244

28. Positioning the Duplexing Unit Stacking Assembly Stopper Plate Drive Solenoid (SL27)

Install the solenoid ③ so that the gap between the shutter plate ① and pin ② is 0.5 mm when the plunger of the solenoid is pushed in.

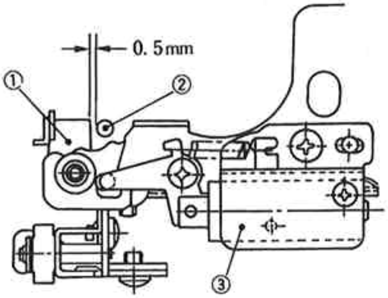


Figure 4-1245

29. Attaching the Timing Belt for the Duplexing Unit Stacking Assembly Paper Guide Plate

Install the gear ① with the paper jogging guide plate fully open.

Attach the timing belt ③ to the gear ① and pulley ②.

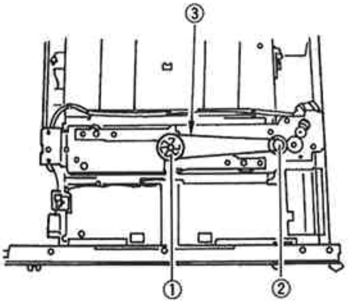


Figure4-1246

30. Positioning the Photosensitive Drum Fixing Shaft

Slide out the photosensiitive drum frame unit about 5 cm from the machine, and insert it back into the machine once again.If the photosensitive drum frame unit cannot be moved smoothly at this time, adjust the position of the photosensitive drum fixing shaft using the drum shaft positioning tool (FY9-3016-000) as follows:

(You need not adjust the position if the copied are free of color displacement, blurring, or pitch discrepancy and the discrepancy between the photosensitive drum fixing shaft and the hole of the photosensitive drum flange is no more than 1 mm and, therefore, the drum fixing shaft may be corrected by hand.)

1) Remove the flywheel.
2) Remove the photosensitive drum frame unit from the machine.
3) Remove the photosensitive drum from the photosensitive drum frame unit.
4) Insert the photosensitive drum frame unit ① into the machine, and fix it in place using three screws ②. At this time, keep the following removed: photosensitive drum, photosensitive drum butting block(front, rear), photosensitive drum center fixing roll, black toner density sensor, photosensitive drum cleaner unit, primary corona assembly, and photosensitive drum cleaner front paper sensor .

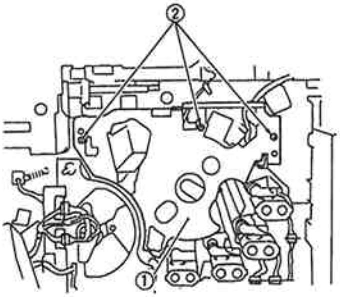


Figure 4-1247

5) Loosen the seven fixing screws ③ of the drum motor assembly. (If the drum shaft support plate fixing ④ is found, remove it.)

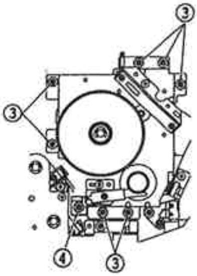


Figure 4-1248

6) Attach the drum shaft positioning tool ⑤ to the photosensitive drum frame unit ⑥ using the two screws ⑦ removed in step 3). (Pay attention to the orientation of the positioning tool.)

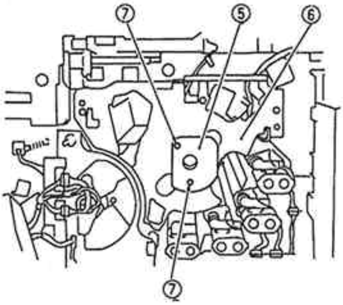


Figure 4-1249

7) Tighten the seven screws on the drum motor loosend in step 5).
8) Install the unit and parts removed in step 5).
9) Detach the drum shaft positioning tool, and remove the photosensitive drum frame unit from the machine; then , install it back to the machine together with the unit and parts removed in step 2), 3), and 4).
10) Install the flywheel, and install the external covers.

31. Adjusting the Transfer Separation Claw Position

Perform the following steps when replacing the transfer sheet.

1) Peel off the transfer sheet.
2) Rotate the transfer drum ring so that the transfer drum connecting plate is opposite of the transfer drum separation claw roll.
3) Push the positioning roll of the transfer drum separation claw so that it comes into contact with the transfer drum ring butting rubber. (Avoid excessive force.)
4) Check to make sure that the distance between the transfer separation claw roll and the transfer drum connecting plate is 0.1 to 0.7 mm using a gap gauge (CK-0057 or CK-0061).
   Note that a Canon-recommended transparency is about 0.1 mm thick, while the gap gauge CK-0057 is 0.3 mm max. and CK-0061 is 0.45 mm thick max.

Caution:
Be sure to measure the highest point of the separation claw roller and the connecting plate.

5) If the gap measured in step 4) is not within the standard, loosen the screw (glued in place), and adjust the position of the separation claw.
6) Repeat steps 3) through 5) until the gap between the separation claw roll and the connecting plate is as specified.
7) If the gap fails to fall within the standard, replace the transfer separation claw assembly, and make adjustments by performing steps 3) through 5).
8) Attach the transfer sheet.

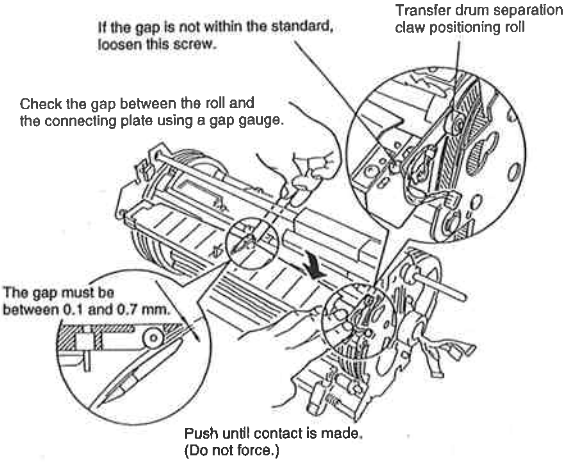

If the gap is not within the standard, loosen this screw.
Transfer drum separation claw positioning roll
Check the gap between the roll and the connecting plate using a gap gauge.
The gap must be between 0.1 and 0.7 mm.
Push until contact is made. (Do not force.)

Figure 4-1250

32.Checking the Position of the Adjusting Spacer for the Laser Reflecting Mirror Height

1) Remove the reader controller cover and the upper right cover.
2) Remove the electrical unit fan mounting plate.
3) Remove the reader controller PCB, and disconnect the connectors found around it.
4) While paying attention to the connectors, remove the two reflecting mirror covers.

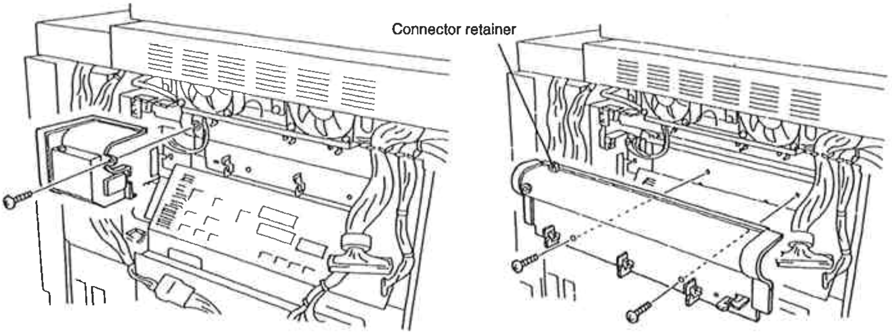


Figure 4-1251

5) Check the dampers of the reflecting mirror shown in Figure 2-70, and put them back to their correct positions if they have become displaced.

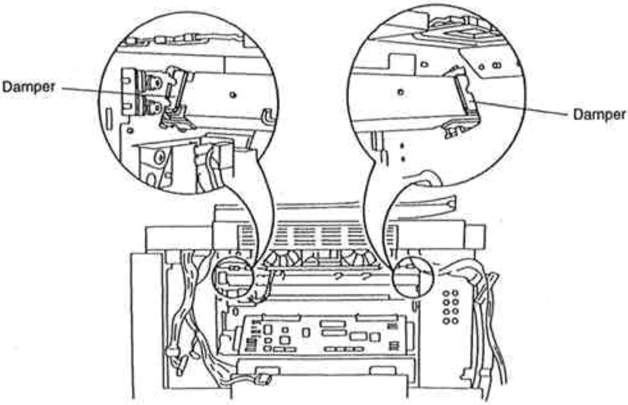


Figure 4-1252

CHAPTER 5

INSTALLATION

The copier is shipped only after it has been adjusted and inspected against strict standards.

It is very important to conduct installation work properly so that the copier will provide the performance it was tested for at the factory.

Have a good understanding of the performance of the machine, install it in a suitable location, and carry out a through inspected to that end.

Some steps used to disassemble/assemble the machine differ depending on the type of machine; such steps are identified by notation TYPE1/TYPE2 in this manual:

Model	CLC700		CLC800	
TYPE	TYPE1	TYPE2	TYPE1	TYPE2
115 V (TWN)	NCN xxxx	NKN xxxx	NCT xxxx	NKT xxxx
115 V (USA)	NCL xxxx	NKL xxxx	NCS xxxx	NKS xxxx
230 V (KOR)	——	PKR xxxx	——	——
230 V (Others)	PCN xxxx	PKN xxxx	PCS xxxx	PKS xxxx
230 V (UK)	QCQ xxxx	QKQ xxxx	QCS xxxx	QKS xxxx
230 V (CA)	RCQ xxxx	RKQ xxxx	RCS xxxx	RKS xxxx
230 V (FRN)	SCR xxxx	SKR xxxx	SCS xxxx	SKS xxxx
230 V (GER)	TCR xxxx	TKR xxxx	TCS xxxx	TKS xxxx
230 V (AMS)	UCR xxxx	UKR xxxx	UCS xxxx	UKS xxxx

I. SELECTING THE SITE OF INSTALLATION 5-1
II. INSTALLING THE MACHINE 5-2
III. RELOCATING THE MACHINE 5-22
IV. INSTALLING THE ORIGINAL TRAY 5-26
V. INSTALLING THE CONTROL CARD-V 5-27
VI. INSTALLING THE DRUM HEATER 5-29
VII. INSTALLING THE CASSETTE HEATER (CLC700) 5-36
VIII. INSTALLING THE CASSETTE HEATER (CLC800) 5-39

I. SELECTING THE SITE OF INSTALLATION

Make the following considerations when selecting the site of installation.

Visit the user before delivery of the machine to make sure that the site meets all the requirements.

1) There must be a grounded power outlet capable of providing the rated voltage ±10%. In addition, the outlet must be available exclusively for the machine—sharing it with a refrigerator or the like, which keeps turning on and off, causes voltage fluctuations, affecting the copy images.

2) The temperature and humidity of the site must be within the range shown in Figure 5-1. In particular, avoid spots near water faucets, water boilers, humidifiers, and refrigerators.

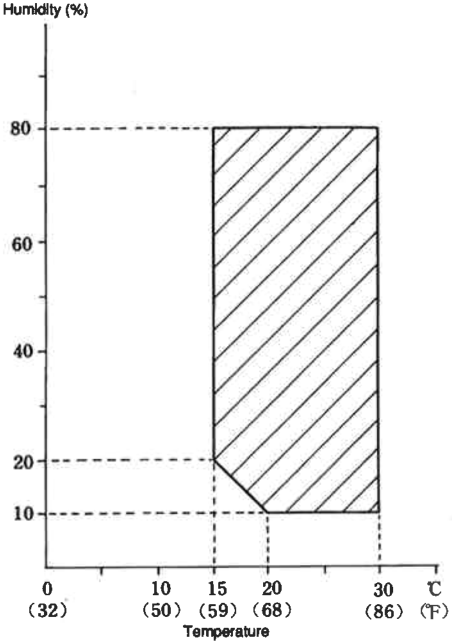


Figure 5-1 Site Environment

3) Avoid spots near sources of fire or spots subject to dust or ammonium gas. Avoid spots subject to direct rays of the sun; otherwise, provide curtains.

4) Make sure the room is well ventilated.

Caution:
The level of ozone generated by the machine will not affect the health of the individuals near it; however, it is best to make sure that the site is adequately ventilated, as some find the odor unpleasant.

5) Make sure the floor can support the machine level, and the machine's feet will remain in contact with the floor.

6) Make sure the site will allow adequate space for maintenance and copying work.

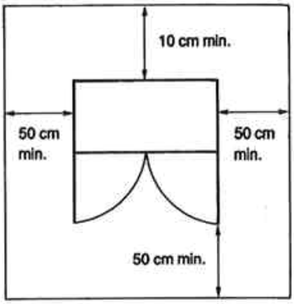
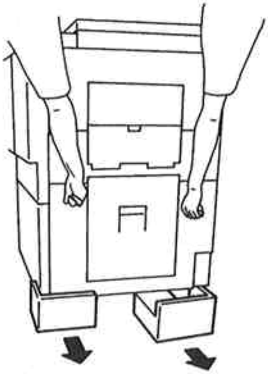


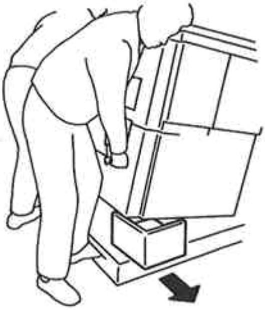
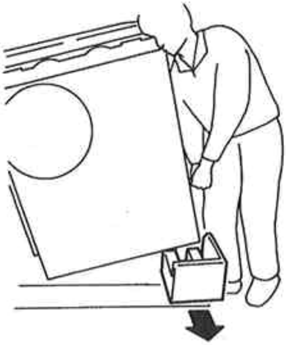
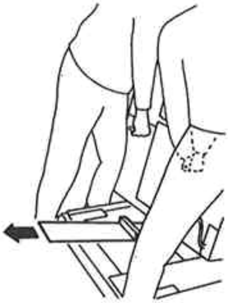
Figure 5-2

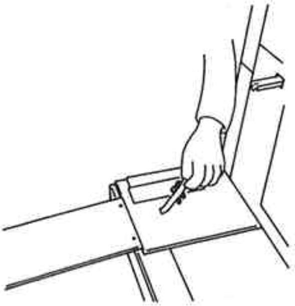
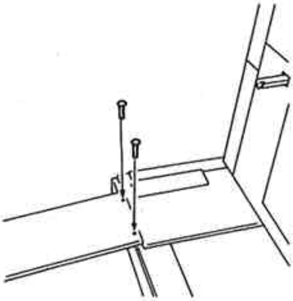
II. INSTALLING THE MACHINE

Bringing in metal objects from a cold to warm place causes droplets of water to form on surfaces. This phenomenon is known as *condensation*, and condensation in a copier can lead to generation of blank copies. To prevent such a problem, leave the machine alone for at least one hour, and make sure that it has become acclimatized to the room temperature before beginning work.

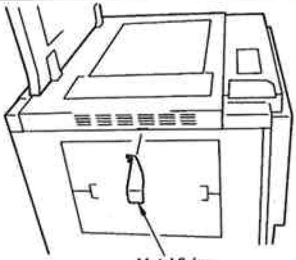
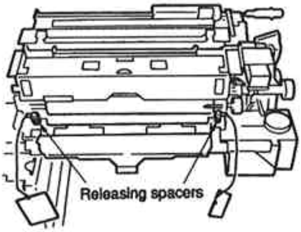
A. Unpacking

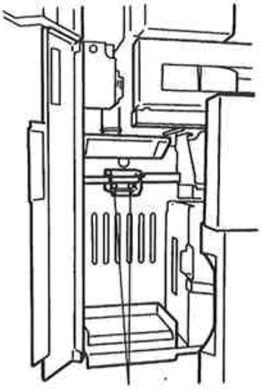
No.	Step	Remarks
1	Open the shipping box.	
2	Tear the plastic bag containing the copier, and remove the fixing tape; then, pull out the grips.	
3	The copier weighs about 300 kg; take sufficient care when performing the work. Work in a group of two—lift the pick-up side (right side) about 5 cm, and pull out the cushion material from the bottom in the direction of the arrows.	

No.	Step	Remarks
4	Work in a group of two—lift the delivery side (left side), and remove the cushion material from the bottom in the direction of the arrows.	 
5	Work in a group of two—lift the pick-up side (right side), and pull out the cardboard from the bottom, and remove the slope plate.	

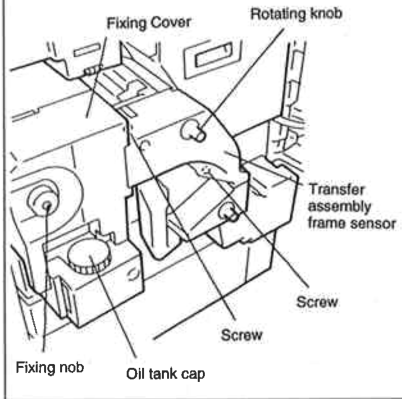
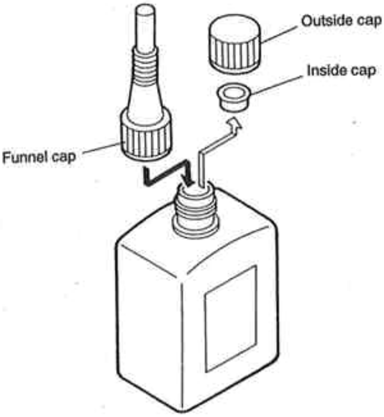
No.	Step	Remarks
6	Remove the two pins attached with tape; set the slope plate, and fix it in place using the pins. (Make sure that the boss in the middle faces down.)	 
7	Slide the copier down the skid. (Work in a group of two—one pushing the copier and the other, supporting it from its bottom.)	
8	Take out the parts and accessories from the cardboard box that came with the machine. Take out the M, C, Y, and Bk starter developers, and shake them well; peel off the seals, and keep them in a place free of dust. This is to acclimatize the starter developers.	Make sure that none of the following parts and accessories are missing: • Copy tray • Control key, door switch lever • Silicone oil bottle • Hopper stopper (4 pcs.) • User's Manual • Funnel for starter developer (4 pcs.) • Waste toner case • Size Label, duplexing unit label • Silicone oil tank funnel cap • Grounding wire

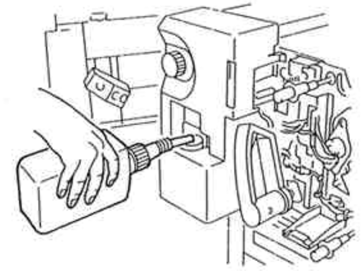
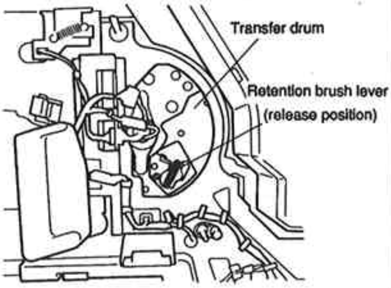
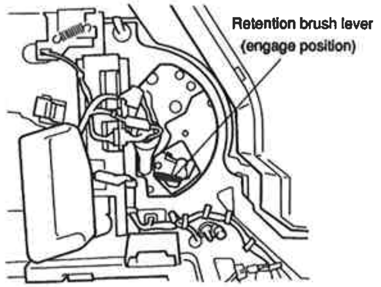
B. Removing the Fixing Members and Installing the Waste Toner Case

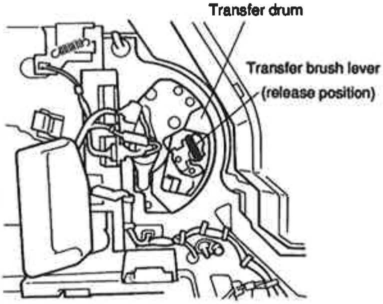
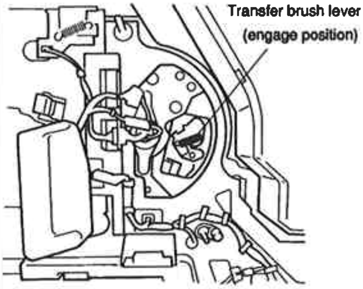
No.	Step	Remarks
1	Remove the packaging tape and protection tape from the copier.	
2	Removing the scanner metal fixing Peel off the tape from the scanner metal fixing found on the outside of the left cover; then, slide the metal fixing from rear to front, and pull it to the left to remove.	 Keep the metal fixing in the service document compartment found below the right door for use when relocating the machine.
3	Open the front door, and remove the tape from the lever and fixing members.	
4	Take out the fixing members and fixing tape from inside the cassette.	
5	Release the lever, and slide out the transfer frame.	
6	Pull out the two fixing roller releasing spacers.	

No.	Step	Remarks
7	Slide out the cassette 2, duplexing unit, and cassettes 3 and 4 and open the lower cover, and remove the grip from the bottom left front (2 screws); then, set the waste toner case.	 The grip found at the bottom left front will be used again when relocating the machine: store it away in the service document compartment found below the right door.

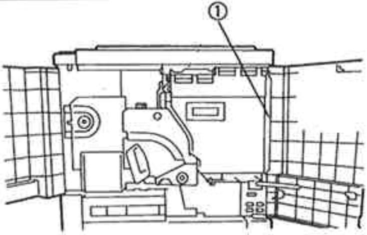
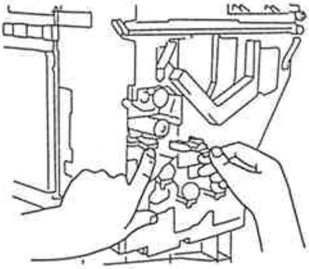
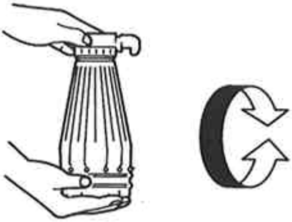
C. Pouring the Fixing Oil

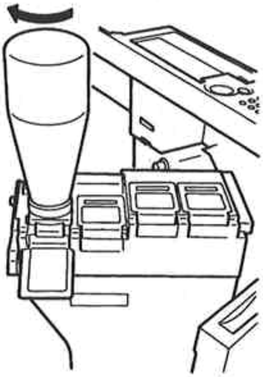
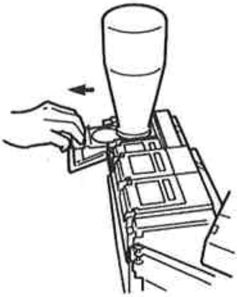
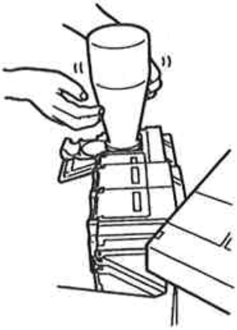
No.	Step	Remarks
1	Remove the transfer drum rotating knob; then remove the transfer frame cover (2 screws), and remove the fixing member. Remove the fixing assembly rotating knob (1 screw), then, remove the fixing cover (2 screws), and remove the packing from inside.	 Fixing Cover Rotating knob Transfer assembly frame sensor Screw Screw Fixing nob Oil tank cap
2	Remove the cap from the fixing oil tank.	
3	Remove the outside and inside caps of the fixing oil bottle, and fit the funnel cap that comes with the machine in their place.	 Outside cap Inside cap Funnel cap

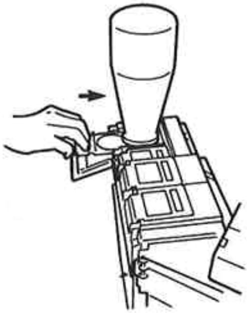
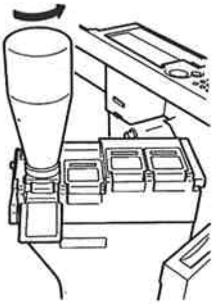
No.	Step	Remarks
4	Pour all the fixing oil into the tank.	
5	Fit the caps tothe fixing oil tank.	
6	Turn the gear of the transfer drum counterclockwise with a finger until the lever of the retention brush is in view. **Caution:** Turning the gear counterclockwise can generate a clicking sound because of the CCW rotation stop; this is normal, and you may ignore the sound. Shift the lever of the retention brush to the left to engage the retention brush.	 Transfer drum Retention brush lever (release position)  Retention brush lever (engage position)

No.	Step	Remarks
7	Turn the gear of the transfer drum with a finger until the lever of the transfer brush is in view. Shift the lever of the transfer brush to the left to engage the transfer brush.	 Transfer drum Transfer brush lever (release position)  Transfer brush lever (engage position)
8	Install the cover and the rotating knob; then, push the transfer assembly into the machine.	

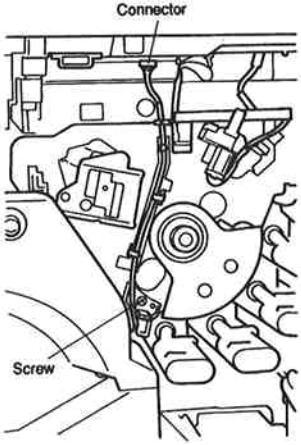
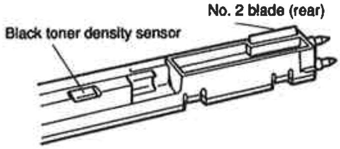
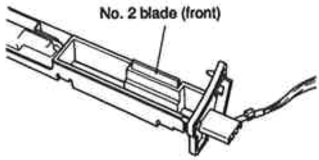
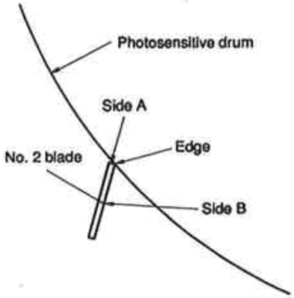
D. Supplying Toner

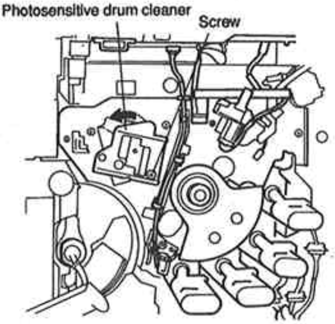
No.	Step	Remarks
1	Remove the screw from the stopper plate on the right door, and fully open the right door. Remove the slide stoppers of the hopper unit (2 screws).	
2	While pushing the hopper stopper down, slide out the hopper unit, and rotate it.	
3	Place copy paper between the open hopper and the floor, and insert the hopper stopper (accessory) into the four supply mouths found at the bottom of the hopper (for each color).	
4	Slowly agitate the Bk toner bottle at least 20 time as shown. **Caution:** Agitate the bottle just before setting it onto the hopper. Make sure that the toner has become loose and that there are no lumps.	

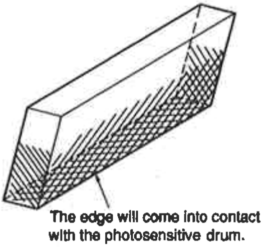
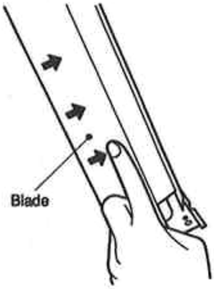
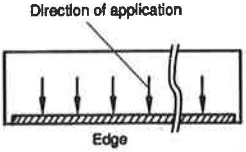
No.	Step	Remarks
5	Open the lid of the Bk toner hopper, and attach the Bk toner bottle into the hopper; hold the base of the bottle, and turn the bottle about 10° to the right.	
6	Open the slide shutter of the Bk toner bottle, and tap the bottle a couple of times on its bottom and side. • Record when you have started supplying the toner. Make sure that all of the toner has fallen into the hopper.	 

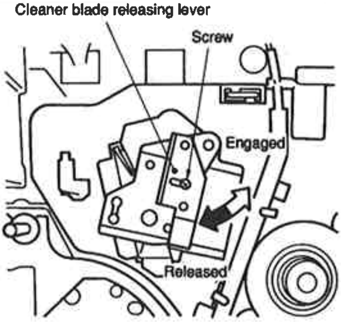
No.	Step	Remarks
7	Close the slide shutter of the Bk toner bottle, and turn the bottle about 10° to the left to remove. Check to make sure that no toner remains on the mesh covering the toner inlet; if toner remains, tap lightly on the hopper assembly so that the toner will fall into the hopper.	 
8	Repeat the steps for the M, C, and Y toners.	
9	Perform the steps given under "E. Removing the Drum Cleaner" and "F. Supplying the Starter Developer."	

E. Removing the Drum Cleaner

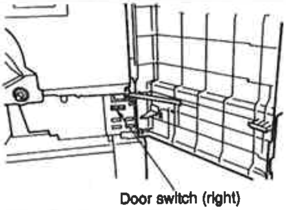
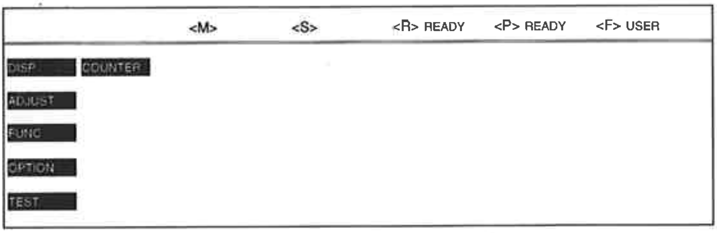
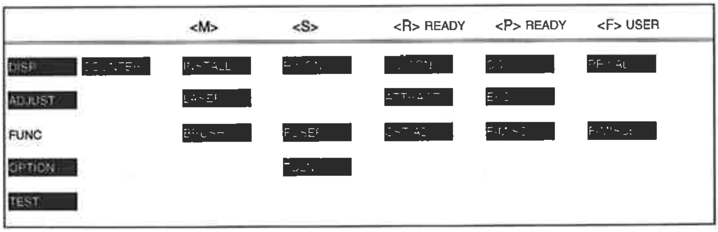
No.	Step	Remarks
1	Disconnect the connector, free the harness from the edge saddle, and pull out the black toner density sensor (1 screw); be sure to pull the unit straight out.	 Connector Screw
2	Apply drum cleaner lubricant evenly on the No. 2 blade (front, rear). • Shake the drum cleaner lubricant well before application. • Be sure to apply the lubricant on sides A and B as well as the edge. • Do not rub in the lubricant, or you may chip the edge; instead, tap it lightly onto the blade.	 No. 2 blade (rear) Black toner density sensor  No. 2 blade (front)  Photosensitive drum Side A No. 2 blade Edge Side B

No.	Step	Remarks
3	Dry wipe the sensor face of the black toner density sensor. • Do not use alcohol.	
4	After attaching the black toner density sensor, connect the connector (1 screw). • Take care not to touch the photosensitive drum.	Bringing the No.2 blade into contact with the photosensitive drum will let the lubricant stick to the photosensitive drum, possibly leading to transfer faults (white spots)
5	Remove the screw, and shift the photosensitive drum cleaner to the left; then, slide out the photosensitive drum cleaner.	

No.	Step	Remarks
6	Apply drum cleaner lubricant evenly on the blade of the photosensitive drum cleaner; use lint-free paper around your finger. • Uneven application can cause white vertical lines on copies. • Be sure to apply to all surfaces in addition to the edge, except the lower surface. • Do not rub in the lubricant, or you may chip the edge; instead, tap lightly. • Start from the top toward the edge surface as if to orient the lubricant where it will come into contact with the drum.	 The edge will come into contact with the photosensitive drum.   Direction of application Edge
7	Attach the photosensitive drum cleaner (1 screw). • Take care not to touch the photosensitive drum.	

No.	Step	Remarks
8	Loosen the screw to engage the cleaner releasing lever; fix the screw in place. (The blade is engaged when the lever is as shown in the diagram). **Caution:** You must make sure that the screw is securely in place; otherwise, the cleaning assembly may become damaged.	 Cleaner blade releasing lever Screw Engaged Released
9	After drawing out the transfer assembly frame and attaching the transfer assembly frame cover (2 screws), attach the transfer drum rotating knob.	

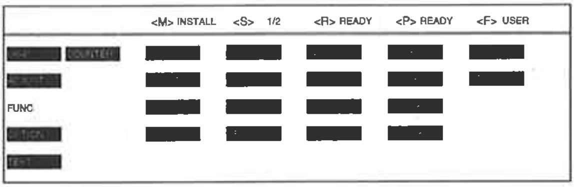
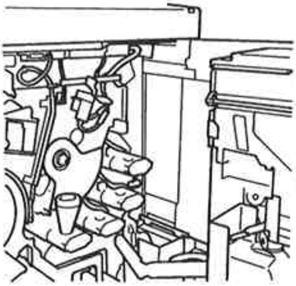
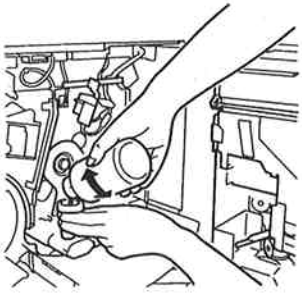
F. Supplying the Starter Developer

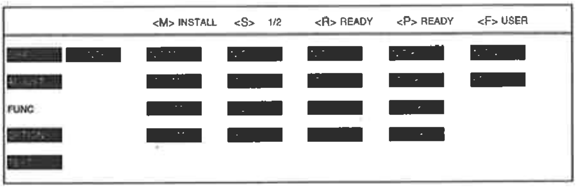
No.	Step	Remarks
1	Close the left door, and insert the door switch actuator into the door switch (right).	
2	Insert the control key	
3	Connect the power plug, and turn on the power switch.	Make sure that the voltage is as rated, ±10%.
4	During the wait period, perform the following: • Place paper in the cassettes. • Attach the original tray (option).	
5	When the warm-up period is over, press *, 2, 8, and * to activate service mode. (Press keys 2 and 8 simultaneously.)	
6	Press ‘FUNC’. 	
7	Press ‘INSTALL’. 	

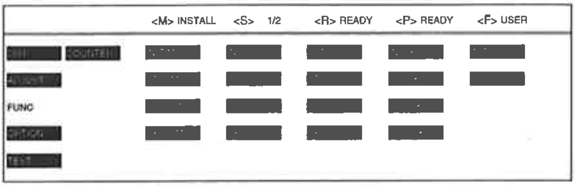
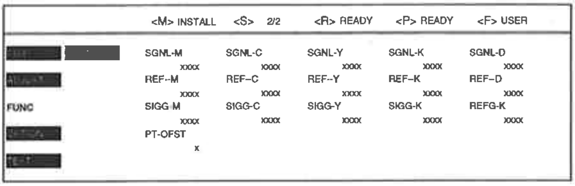
Door switch (right)

<M>
<S>
<R> READY
<P> READY
<F> USER
DISP
COUNTER
ADJUST
FUNC
OPTION
TEST

<M>
<S>
<R> READY
<P> READY
<F> USER
DISP
ADJUST
FUNC
OPTION
TEST
INSTALL
LASER
BRUSH
FUSER

No.	Step	Remarks
8	Press 'SPLY-K'.  <M> INSTALL <S> 1/2 <R> READY <P> READY <F> USER COUNTER FUNC Check to make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing 'SPLY-K' in service mode.	
9	The Bk developing assembly will become engaged, and the feeding screw inside the developing assembly will start to rotate.	
10	Attach the starter developer supply funnel that comes with the copier (not with the starter developer) to the supply mouth of the Bk developing assembly.	 • Perform for one color only. • Do not use the supply funnel that comes with the starter developer; its mouth is too small.
11	Pour the starter developer into the developing assembly. • Try slanting the bottle gradually while turning it to avoid spilling the starter developer.	

No.	Step	Remarks
12	When all starter developer has poured into the developing assembly, press the Stop key to stop operation.	
13	Repeat steps 9, 10, 11, 12, 13, and 14 for M, C, and Y toners. (Press 'SPLY-M', 'SPLY-C', or 'SPLY-Y' according to the color of the toner.)	
14	When all developing assemblies have been supplied with their respective toners, wait 10 min. or more; and then remove the toner hopper stoppers. **Caution:** Be sure to pull the hopper stopper horizontally; pulling it at an angle will damage the sealing, whose chips may fall into the developing assembly.	
15	Open the left door, turn the hopper unit slowly, and place the spacer on the left of the hopper on the rail while pushing the hopper stopper.	
16	Push in the hopper unit carefully until it reaches the locking position at the rear. **Caution:** Exercise care; rough handling can cause large amounts of toner to fall from the toner hopper assembly.	
17	Press 'STIR-4', and wait until stirring stops (about 10 min).  <M> INSTALL <S> 1/2 <R> READY <P> READY <F> USER FUNC Check to make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing 'STIR-4' in service mode.	

No.	Step	Remarks
18	Press 'INIT-4'.  <M> INSTALL <S> 1/2 <R> READY <P> READY <F> USER FUNC Check to make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing 'INIT-4' in service mode.	Wait until ATR is over; it will take about 5 min.
19	Press 'INTERRUPT'.  <M> INSTALL <S> 2/2 <R> READY <P> READY <F> USER FUNC SGNL-M xxxx SGNL-C xxxx SGNL-Y xxxx SGNL-K xxxx SGNL-D xxxx REF--M xxxx REF–C xxxx REF--Y xxxx REF–K xxxx REF–D xxxx SIGG M xxxx SIGG-C xxxx SIGG-Y xxxx SIGG-K xxxx REFG-K xxxx PT-OFST x **Caution:** Check to make sure that the wait-up period (<P> in service mode is 'READY') is over before executing 'INIT-4'.	
20	Take notes of the value of 'SGNL-K' indicated when you executed ATR automatic adjustment in step 19.	
21	Select 'DC-CON' under 'FUNC' of service mode, and enter a value obtained by adding '37' to the value being indicated for 'SGNL-K' into 'SGNL-K'.	
22	Press 'SEND' at the lower right hand corner of the screen, and leave service mode; then, turn off and then on the power switch.	
23	Record data related to ATR on the Service Data Sheet. For 'SGNL-K', use the value you entered for a second time.	The Service Data Sheet is attached behind the DC controller PCB cover on the rear cover.
24	Press the Reset key twice, and remove the door switch actuator.	
25	Attach the slide stopper of the hopper unit and the stopper tape on the right door (1 screw).	
26	Close the front door.	

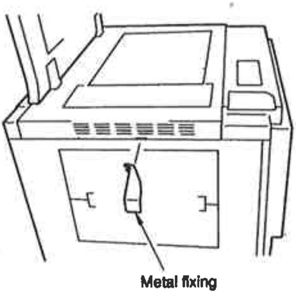
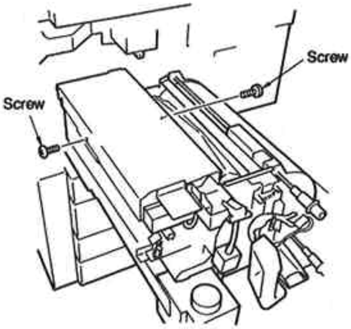
G. Checking the Images/Operation

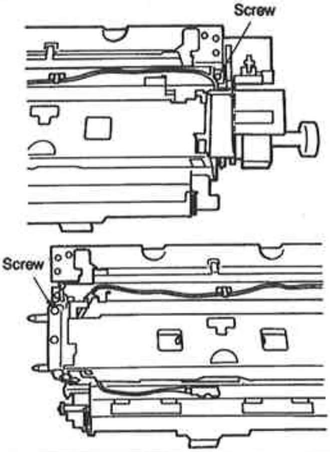
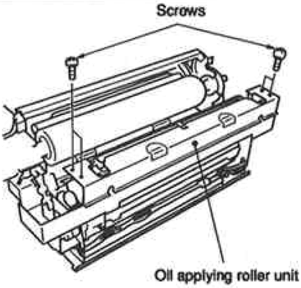
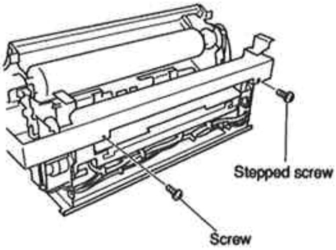
No.	Step	Remarks
1	Remove the door switch actuator, and close the front door.	
2	Configure the cassette (size) to suit the needs of the user. First, adjust the side guide plate to suit the paper size; then, put copy paper in the cassette, and adjust the rear end guide plate to the trailing edge of the paper.	
3	Remove the cassette size plate from each cassette holder, and attach the appropriate size label to each plate. Put the size plates back into position.	
4	Set the cassettes into the copier.	• Make sure that the 'ADD PAPER' message goes off. • Press the keys other than the Copy Start key on the control panel to make sure that the operations are normal.
5	Set the Test Sheet on the copyboard, and check the images on its copies made using all cassettes.	• Make sure that there is no abnormal sound. • Check the copy image for each default reproduction ratio. • Make sure the copies are made as many as specified. • If the copy image is not normal, perform the Image Adjustment Basic Procedure.
6	Select 'PASCAL' under 'ADJUST' in service mode; then, make sure that $\boxed{\text{PASCAL}}$ is '1'; otherwise, set it to '1'.	
7	Press the Reset key to leave service mode.	
8	Make copies in manual mode.	• Make sure that the copies are made normally.
9	Check that all external covers are free of scratches and deformations.	
10	Clean up the area around the copier.	
11	Put the copier back into its original position.	• Make sure that the copier is more or less level.
12	Fill out the Service Sheet with necessary information.	

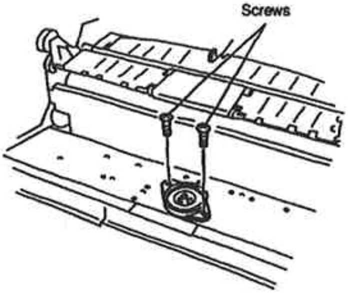
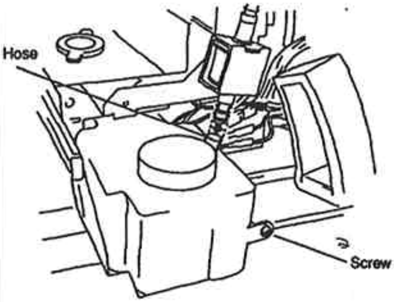
Install the options as necessary only after completing the above steps.

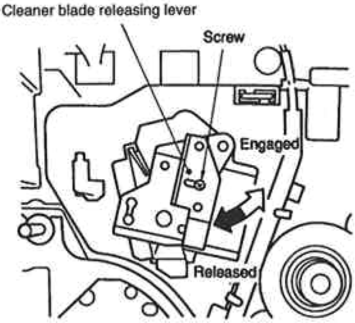
III. RELOCATING THE MACHINE

Go through the following steps before moving the machine by truck or other means of transportation after it has been installed.

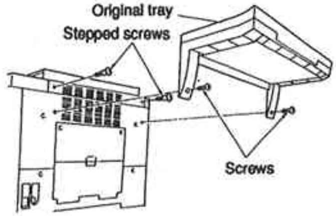
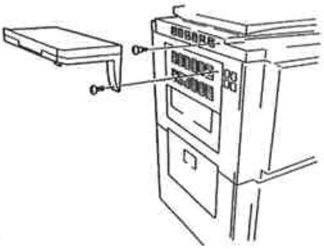
No.	Step	Remarks
1	Tape the lid of the toner hopper in place.	
2	Attaching the Scanner Metal Fixing Put the metal fixing to the hole of the delivery assembly, and fix the scanner mirror mount by sliding it from the front to the rear.	
3	Slide out the transfer assembly frame.	
4	Attach the fixing members from below the transfer assembly frame for the transfer drum and transfer cleaner.	
5	Pull out the fixing assembly, and remove the fixing assembly cover. (Place a newspaper or the like on the floor to avoid staining with fixing oil.)	

No.	Step	Remarks
6	Remove the two screws, and open the upper fixing roller unit.	
7	Remove the four screws, and remove the oil applying roller unit. (Take care so that oil will not drip from the oil applying roller unit onto the floor.)	
8	Remove the two screws, and remove the upper oil pan. (The rear is fixed with a stepped screw.) Tilt the upper oil pan to pour the fixing oil into the oil case. Attach the upper oil pan, oil applying roller unit, and upper fixing roller unit; then, push in the fixing assembly/transfer assembly frame unit into the copier.	

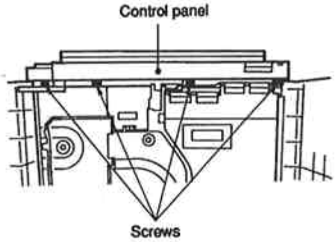
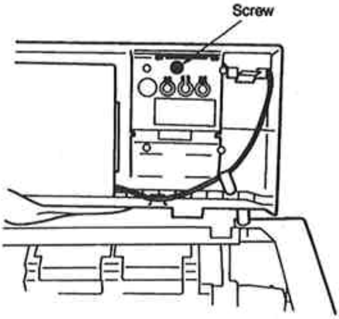
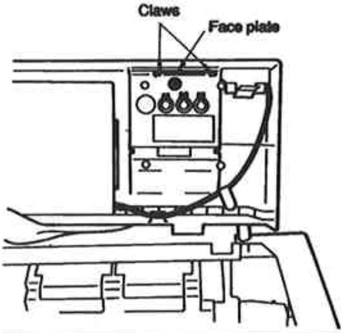
No.	Step	Remarks
9	Remove the two screws, and remove the oil receptacle.	
10	Detach the hose of the oil tank from the electromagnetic pump.	
11	Remove the screw, and slide out the oil tank assembly toward the front; then, draw out the silicone oil from the oil tank. **Reference:** The filter in the pipe of the oil tank is used to prevent contamination by foreign matter; its location is not important as long as its is inside the pipe.	
12	Assemble the part in reverse order (steps 11, 10, 9).	

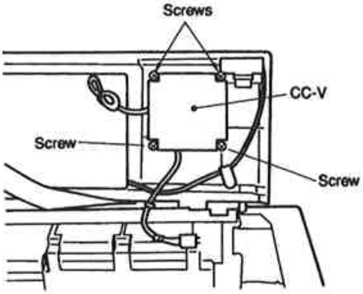
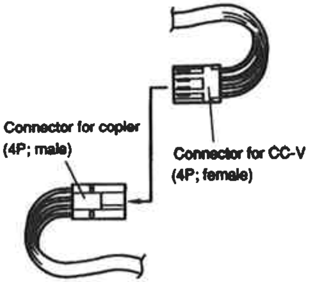
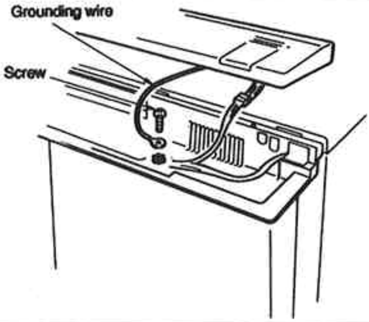
No.	Step	Remarks
13	Loosen the screw, and shift the cleaning blade releasing lever slowly to release position; then, tighten the screw while holding the lever in place.	 Cleaner blade releasing lever Screw Engaged Released
14	Tape the releasing lever of the transfer drum in place.	
15	Tape the front door, delivery assembly, and pick-up assembly in place.	

IV. INSTALLING THE ORIGINAL TRAY

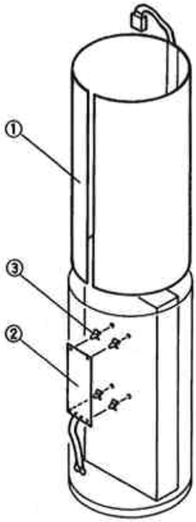
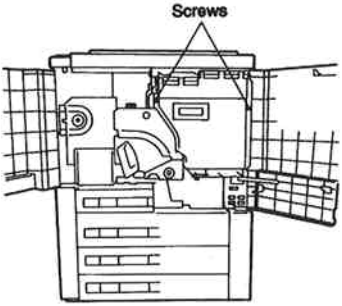
No.	Step	Remarks
1	Peel off the face sticker from the copier, and fit two stepped screws to the left or right of the copier.	
2	Fit the original tray on the stepped screws, and fix the original tray with screws.	 

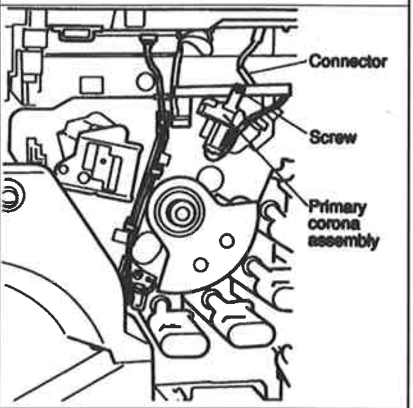
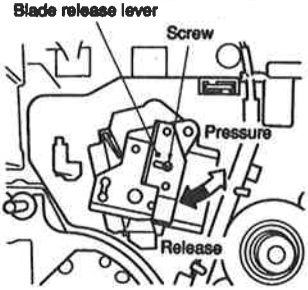
V. INSTALLING THE CONTROL CARD-V

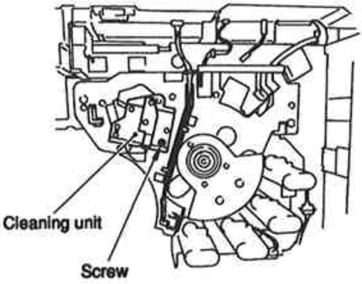
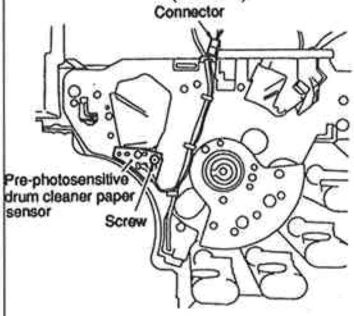
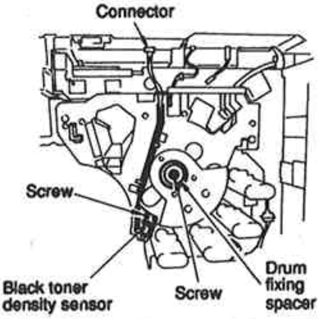
No.	Step	Remarks
1	Open the copier's front door, and remove the four screws used to fix the control panel in place; then, turn over the control panel.	
2	Remove the screw from the face plate.	
3	Disengage the claws, and remove the face plate from the card slot.	
4	Attach the insulating sheet to the opening for the CC-V's display on the control panel.	
5	Peel off the protective sheet attached to the display of the CC-V.	

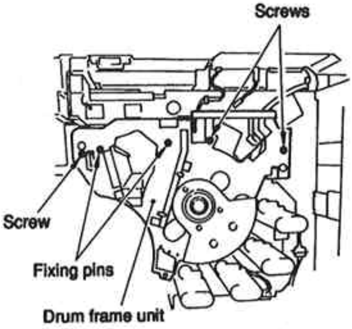
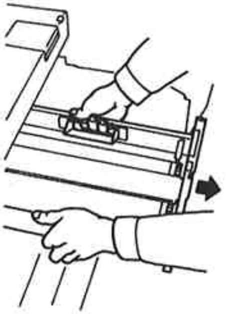
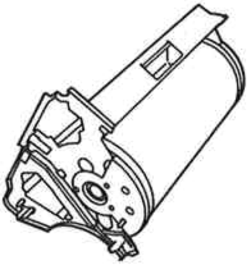
No.	Step	Remarks
6	Fix the CC-V to the control panel using four self-tapping screws. At this time, insert a card into the CC-V; and fix the CC-V at a point where insertion and removal of the card is smooth. In addition, check to make sure that the connector for the printer is centered in the hole.	 Screws CC-V Screw Screw
7	Disconnect the shorting connector, and connect the connector (4P) of the CC-V in its place. (The connector for the copier is found under the control panel.)	 Connector for copier (4P; male) Connector for CC-V (4P; female)
8	Fix the grounding wire of the CC-V using the screw attached to the bottom of the copier's control panel.	 Grounding wire Screw
9	Peel off the protective sheet from the control panel nameplate of the CC-V.	
10	Attach the control panel nameplate of the CC-V to the copier's control panel.	
11	Attach the control panel to the copier.	
12	Turn on the copier's power switch, and check the operation of the CC-V.	

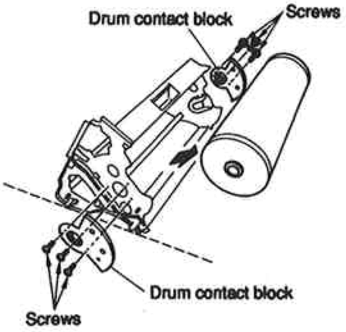
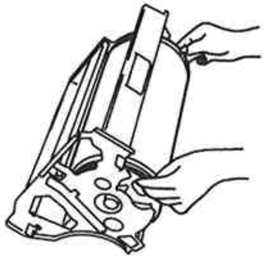
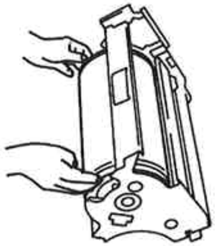
VI. INSTALLING THE DRUM HEATER

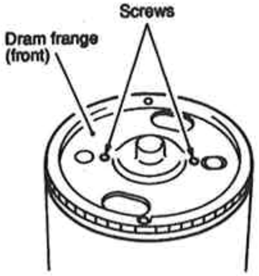
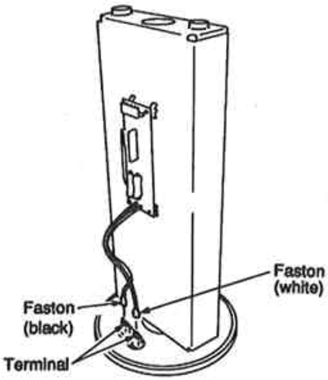
No.	Step	Remarks
1	Open the carton and check that the units shown below are available. ① Drum heater ....1 unit ② Heater controller PCB ....1 pc. ③ Locking support ....4 pcs.	
2	Turn off the power switch, and disconnect the power plug.	
3	Open the front doors (left, right), and remove the screws to detach the hopper unit stoppers.	

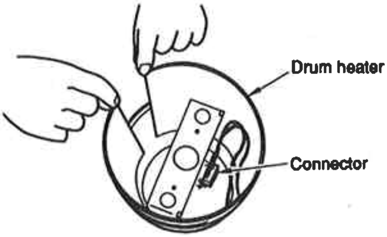
No.	Step	Remarks
4	Open the hopper unit fully. Thereafter, disconnect the connector of the primary corona assembly, and remove the screw; then, draw out the primary corona assembly.	 Connector Screw Primary corona assembly
5	Remove the transfer drum knob; then, remove the transfer assembly frame cover.	
6	Loosen the screw, and shift the cleaning blade releasing lever slowly to release position; then, tighten the screw while holding the lever in place.	 Blade release lever Screw Pressure Release

No.	Step	Remarks
7	Remove the screw, and detach the photosensitive drum cleaning unit. Remove the screw, and disconnect the connector; then, remove the pre-photosensitive drum cleaner paper sensor. (for future; TYPE 2 only)	 Cleaning unit Screw (TYPE 1)  Connector Pre-photosensitive drum cleaner paper sensor Screw (TYPE 2)
8	Disconnect the connector for the black toner density sensor, and remove the screw to detach the black toner density sensor.	 Connector Screw Black toner density sensor Screw Drum fixing spacer
9	Remove the screw to detach the photosensitive drum fixing spacer.	

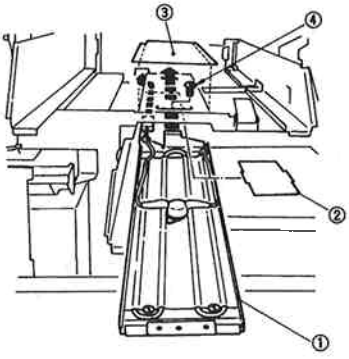
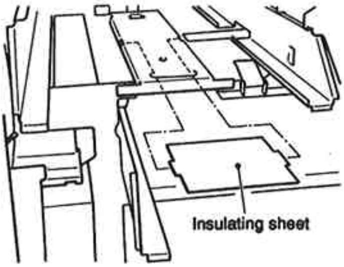
No.	Step	Remarks
10	Remove the three screws, and loosen the two fixing pins; then, pull out the photosensitive drum frame unit. **Caution:** ⚠ ① Make sure that the transfer unit is properly seated. ② When pulling out the photosensitive drum, take extra care so as to avoid damage to the drum.	 
11	Hold the grips, and place the photosensitive drum frame unit as shown.	

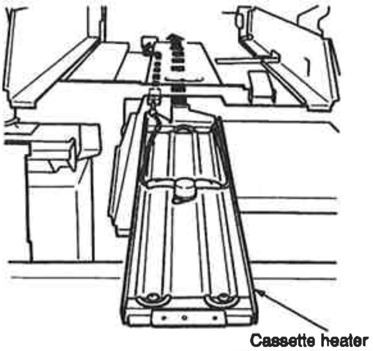
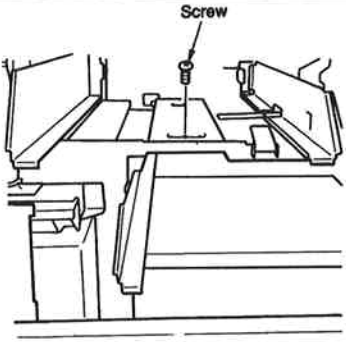
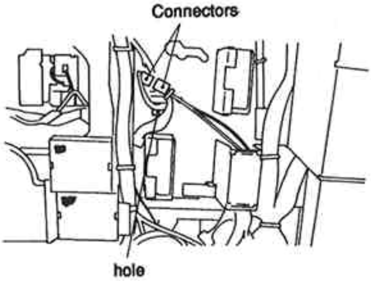
No.	Step	Remarks
12	Remove the six screws, and detach the photosensitive drum contact block (front, rear)	 Drum contact block Screws Drum contact block Screws
13	Pull out the photosensitive drum unit carefully. **Reference:** Put the hands as shown to facilitate removing the pho-tosensitive drum. **Caution:** ⚠ Put the photosensitive drum into the photosensitive drum frame unit while taking care not to damage it.	 

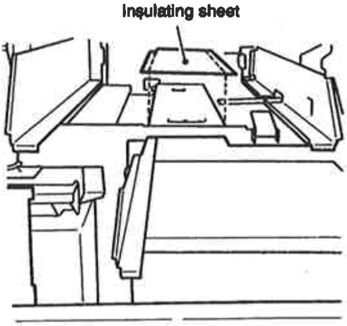
No.	Step	Remarks
14	Place the photosensitive drum so that the drum heater friction plate of the photosensitive drum unit is at the bottom.	
15	Remove the two screws, and remove the drum flange (front); then, remove the photosensitive drum. **Caution:** ⚠ Be sure to keep the photosensitive drum in a dark place, thereby protecting it from light.	
16	Attach the locking support and the drum heater controller PCB to the drum flange connecting plate.	
17	Insert the two fastons of the drum heater controller PCB into the terminal found on the drum flange (rear).	
18	Attach the photosensitive drum.	

No.	Step	Remarks
19	Insert the drum heater, and connect the connector of the drum heater controller PCB.	
20	Attach the drum flange (front).	
21	Put the photosensitive drum into the photosensitive drum frame unit; then, attach the contact block detached in step 12). **Caution:** ⚠ Put the photosensitive drum into the photosensitive drum frame unit while taking care not to damage it.	
22	Put the photosensitive drum frame unit into the copier; then, attach the photosensitive drum fixing spacer, and fix it in position using the screw removed in step 9). **Caution:** ⚠ Put the photosensitive drum into the photosensitive drum frame unit while taking care not to damage it.	
23	Attach the photosensitive cleaning unit and the black toner density sensor and the primary corona assembly; then, shift the cleaning blade releasing lever into locking position.	
24	After attaching the transfer drum knob and the transfer assembly frame cover, close the hopper; then, attach the hopper unit stopper, and close the front door. **Caution:** ⚠ Be sure to use the white faston on the outside electrode; use the black faston on the inside electrode.	

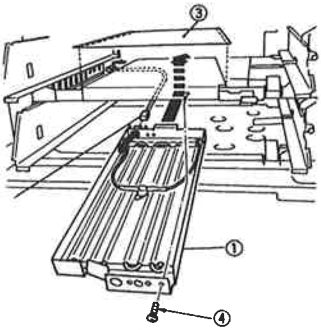
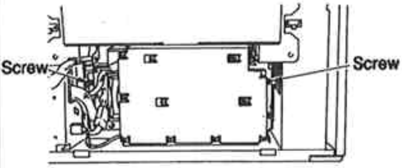
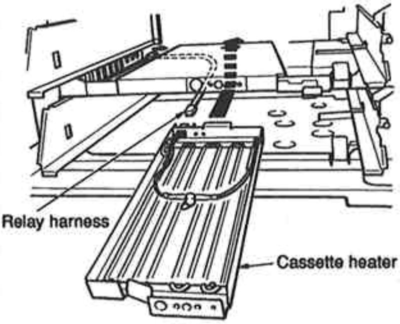
VII. INSTALLING THE CASSETTE HEATER (CLC700)

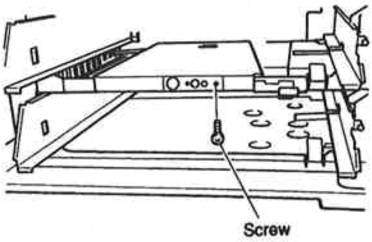
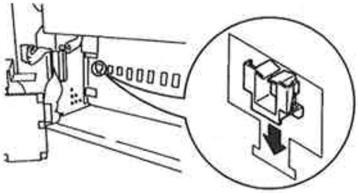
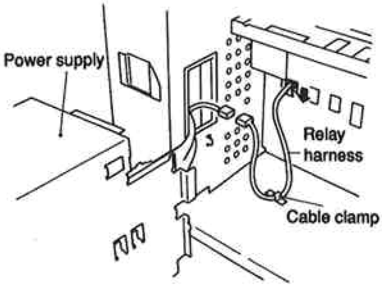
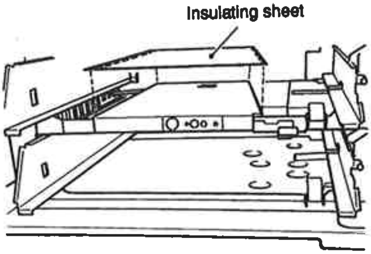
No.	Step	Remarks
1	Open the carton and check that the items shown below are available. ① Cassette heater .... 1 unit ② Insulating sheet .... 1 pc. ③ Insulating sheet .... 1 pc. ④ Screw .... 1 pc.	
2	Disconnect the power cord from the electrical outlet.	
3	Slide out the cassette 1 and the cassette 2.	
4	Remove the five screws, and detach the rear cover.	
5	Remove the screw, and open the DC controller PCB.	
6	Attach the insulating sheet along the stay of the cassette 1.	

No.	Step	Remarks
7	Insert the cassette heater into the hole at the rear of the stay in the cassette 1. At this time, be sure to lead the connector of the cassette heater through the hole in the copier's rear side plate.	
8	Fix the cassette heater in place on the stay in the cassette1 using a screw.	
9	Connect the connector of the cassette heater.	

No.	Step	Remarks
10	Attach the insulating sheet to the stay of the cassette 1.	
11	After closing the DC controller PCB and attaching the rear cover, slide in the cassette 1 and the cassette 2.	

VIII. INSTALLING THE CASSETTE HEATER (CLC800)

No.	Step	Remarks
1	Open the carton, and check that the items shown below are available. ① Cassette heater .... 1 unit ② Relay harness .... 1 pc. ③ Insulating sheet .... 1 pc. ④ Screw .... 1 pc. ⑤ Cable clamp .... 1 pc. ⑥ Edge saddle (largbe, small) ...... 1 pc. each	
2	Disconnect the power cord from the electrical outlet.	
3	Slide out the cassettes 3 and 4.	
4	Remove the five screws, and detach the rear cover.	
5	Remove the two screws, and detach the left cover; then, remove the two screws, and pull out the power supply unit.	
6	Connect the relay harness to the cassette heater, and insert the cassette heater into the hole at the rear of the stay in the cassette 3. At this time, be sure to lead the connector of the cassette heater through the hole in the copier's left side plate.	

No.	Step	Remarks
7	Fix the cassette heater to the stay of the cassette using a screw from the copier's front	
8	Attach the edge saddle (large or small) as shown; select the saddle to suit the shape of the hole in the left side plate.	
9	Connect the connector of the cassette heater.	 Power supply Relay harness Cable clamp
10	Attach the insulating sheet to the stay of the cassette.	 Insulating sheet

No.	Step	Remarks
11	Attach the power unit and the left cover.	
12	Attach the rear cover; then, slide in the cassettes.	

CHAPTER 6

MAINTENANCE AND SERVICING

I. PERIODICALLY REPLACED PARTS .. 6-1
II. DURABLES AND CONSUMABLES 6-2
III. PERIODICAL SERVICING CHART 6-6

I. PERIODICALLY REPLACED PARTS

As of Aug 1, 1996

No.	Parts name	Parts No.	Q'ty	Life (copies)	Remarks
1	Air filter (FM1)	FB2-0247-000	1	20,000	Or, 1yr.
2	Air filter (FM2)	FA6-0731-000	1	20,000	Or, 1yr.
3	Air filter (FM4)	FB2-4383-000	1	20,000	Or, 1yr.
4	Air filter (FM5)	FB2-0247-000	1	20,000	Or, 1yr.
5	Air filter (FM13)	FB2-4383-000	1	20,000	Or, 1yr.
6	Ozone filter (FM4)	FB2-4396-000	1	40,000	Or, 1yr.
7	Ozone filter (FM3)	FB2-4397-000	1	40,000	Or, 1yr.
8	Ozone filter (FM13)	FB2-4396-000	1	40,000	Or, 1yr.

Note:
The above values are estimates only and are subject to change based on future data.
The parts numbers may be updated to reflect the latest design revisions.

II. DURABLES AND CONSUMABLES

As of Aug 1, 1996

No.	Part name	Parts No.	Q'ty	Life	Remarks
1	Waste toner case	FY9-7006-000	1	20,000	Replaced by user
2	Cleaning blade (photosensitive drum cleaner)	FB2-0350-000	1	20,000	
3	Blade side seal (photosensitive drum cleaner)	FF5-2248-000	1	20,000	Edge felt (front)
4		FF5-2249-000	1	20,000	End felt (rear)
5	Scoop-up sheet (photosensitive drum cleaner)	FF5-3993-000	1	20,000	
6	Scoop-up sheet side sticker (photosensitive drum cleaner)	FF5-2246-000	1	20,000	End plastic sponge (front)
7		FF5-2247-000	1	20,000	End plastic sponge (rear)
8	Scanning lamp	FH7-3264-000	1	20,000	
9	Primary corona wire cleaning pad	FF2-3551-000	1	20,000	Upper; for low-humidity environment, 10,000
10		FF2-3552-000	1	20,000	Lower; for low-humidity environment, 10,000
11	Curl pressing sheet (duplexing unit)	FB2-6250-000	8	20,000	Two-sided copy counter reading
12	Fixing oil	FG5-3918-000	1	20,000	1.4L per supply 14K/1.0L
13	Multifeeder separation arm (separation pad)	FF5-2288-000	1	30,000	
14	Charging wire (primary, separation, internal and external static eliminating)	FY3-0040-000	AR	40,000	115/220/240 V; for low-humidity environment, 20,000
15	Grid wire (primary)	Y81-0162-000	1	40,000	For low-humidity environment, 20,000

No.	Parts name	Parts No.	Q'ty	Life	Remarks
16	No. 2 cleaner blade (photosensitive drum)	FB2-0421-000	2	40,000	Both edges (20,000/edge)
17	Starter developer (Bk)	F42-0402-000	1	40,000	
18	Starter developer (C)	F42-0412-000	1	40,000	
19	Starter developer (M)	F42-0422-000	1	40,000	
20	Starter developer (Y)	F42-0423-000	1	40,000	
21	Retention brush unit	FG5-5841-000	1	40,000	
22	Transfer brush unit	FG5-5842-000	1	40,000	
23	Transfer cleaner brush	FA4-8874-000	1	40,000	
24	Oil removing roller (transfer drum assembly)	FB2-0661-000	1	40,000	Two-sided copy counter reading
25	Polishing roller (transfer drum assembly)	FB2-0587-000	1	40,000	
26	Lower fixing roller	FB2-1084-000	1	40,000	Or, in 1 yr. After installation.
27	Upper fixing roller	FB2-1080-000	1	60,000	
28	Transfer drum sheet	FB2-0525-000	1	60,000	
29	Oil applying roller (fixing assembly)	FB2-1143-000	1	60,000	
30	Cleaning belt (fixing assembly)	FB2-3482-000	1	60,000	
31	Multifeeder pick-up roller	FF5-2287-000	1	60,000	
32	Scraper (1)	FF5-2170-000	2	60,000	TYPE1
		FF5-4010-000	2	60,000	TYPE2
33	Oil applying blade (fixing assembly)	FB2-6305-030	1	100,000	
34	Oil removing blade (fixing assembly)	FB3-2047-000	1	100,000	Use one edge only

No.	Parts name	Parts No.	Q'ty	Life	Remarks	
35	Fixing heater (lower; fixing assembly)	FH7-4409-000	1	100,000	115V	Or, 1yr. after installation.
36		FH7-4410-000	1	100,000	220V/240V	
37	Fixing heater (lower; fixing assembly)	FH7-4409-000	1	100,000	115V	Or, 1yr. after installation.
38		FH7-4410-000	1	100,000	220V/240V	
39	Pick-up roller (duplexing unit)	FF5-2101-000	1	100,000	Two-sided copy counter reading (front)	
40		FF5-2102-000	1	100,000	Two-sided copy counter reading (rear)	
41	Feeding roller 1 (duplexing unit)	FF5-2103-000	1	100,000	Two-sided copy counter reading	
42	Separation roller (duplexing unit)	FF5-2104-000	1	100,000	Two-sided copy counter reading	
43	Feeding roller (duplexing unit)	FF5-2101-000	1	100,000	Two-sided counter reading (front)	
44		FF5-2102-000	1	100,000	Two-sided counter reading (rear)	
45	Feeding roller (duplexing unit)	FF5-2274-000	2	100,000	Two-sided counter reading	
46	Scraper (2)	FF5-2171-000	1	100,000		
47	Scraper (3)	FF5-2259-000	1	100,000		
48	Transfer cleaner motor (w/ mounting plate)	FG5-8298-000	1	100,000	If the old type motor (FH6-1018) is installed, replace it together with the mounting plate with the indicated part (left). (Once done, the motor need not be replaced until the end of the machine life.)	
49	Cassette pick-up roller (pick-up assembly)	FF5-1220-000	CLC700:2 CLC800:3	120,000	Rear	
50		FF5-1221-000	CLC700:2 CLC800:3	120,000	Front	

No.	Parts name	Parts No.	Q'ty	Life	Remarks
51	Cassette feeding roller (pick-up assembly)	FB1-7061-000	CLC700:4 CLC800:6	120,000	
52	Cassette separation roller (pick-up assembly)	FB1-7060-000	CLC700:4 CLC800:6	120,000	
53	Pre-exposure lamp	FH7-3266-000	1	150,000	

Note:
The above values are estimates only and are subject to change based on future data.

III. PERIODICAL SERVICING CHART

Caution:
Do not use solvents or oils other than those mentioned.

△ : Clean ● : Replace x : Lubricate □ : Adjust ◎ : Inspect

As of Aug 1, 1996

Unit	Parts	Servicing intervals			Remarks
		every 20,000	every 40,000	every 60,000	
Externals	Copyboard glass	△			Alcohol
	Copyboard cover	△			
	Ozone filter (3 locations)	●			Or, 1 yr.
	Air filter (5 locations)	●			Or, 1 yr.
	Retention roller spring clutch	X			Lubricant
	Spring clutch		X		
Pick-up feeding	Retention roller	△			Remove the retention roller unit to clean.
	Retention roller cleaner	△			
	Retention smoothing roller	△			
	Retention smoothing roller cleaner	△			
	Retention push-up roll	△			Solvent
	Retention unit swing arm	△			
	Pick-up/feeding/separation roller (pick-up assembly)		△		
	Feeding belt		△		Be sure to clean the back of the belt also.
Transfer drum	Transfer drum cleaner	△			
	Oil removing roller		●		Two-sided copy counter reading
	Polishing roller		●		
	Transfer sheet scraper			△	At time of replacing the transfer sheet.
	Transfer drum sheet	△		●	Dry wipe.

△ : Clean ● : Replace x : Lubricate ☐ : Adjust ◎ : Inspect

Unit	Parts	Servicing intervals			Remarks
		every 20,000	every 40,000	every 60,000	
Corona system	Corona wire (primary)*	△	●		Dry wipe with lint-free paper; then, clean with alcohol. (Do not use water; make sure they are completely dry before attachment.) *If in a normal temperature and low-humidity environment, clean the corona wire for every 10,000 copies and replace it for every 20,000 copies by way of providing maintenance.
	Corona wire (separation)*	△	●		
	Corona wire (external static eliminator)*	△	●		
	Corona wire (internal static eliminator)*	△	●		
	Retention smoothing brush		●		
	Transfer brush		●		
	Grid wire (primary)	△	●		
	Shielding plate, block*	△			
	Primary charging wire cleaning pad	●			If in a low-humidity environment, replace for every 10,000 copies.
photosensitive drum	NO. 2 cleaning blade	△			
	Black toner density sensor	△			Dry wipe.
	Filter (pre-exposure lamp)	△			Use blower brush.
	Photosensitive drum butting block		△		Solvent At time of replacing the photosensitive drum.
	Pre-Photosensitive drum paper sensor	△			Clean with a cotton wad.
Developing assembly	Photosensitive drum butting block		△		Use solvent; at time of replacing drum.
Fixing assembly	Separation claw	△			Use solvent.
	Inlet guide	△			
	Outlet guide	△			
	Blade (lower roller)	△			Use lint-free paper.
	Blade (upper roller oil application)	△			
	Thermistor	△			Use lint-free paper.

△ : Clean ● : Replace x : Lubricate ☐ : Adjust ◎ : Inspect

Unit	Part	Servicing intervals			Remarks
		every 20,000	every 40,000	every 60,000	
Scanning system	No. 1 through No. 3 mirrors	△			Use blower brush. (Note 1)
	Reflector (scanning lamp)	△			
	Scanner rail	△x			Clean with alcohol; then, apply lubricant.
Laser exposure system	Dust-proof glass				Use lint-free paper as necessary. (Note 2)
Others	Hopper toner dish	△			Dispose of the collection of toner.

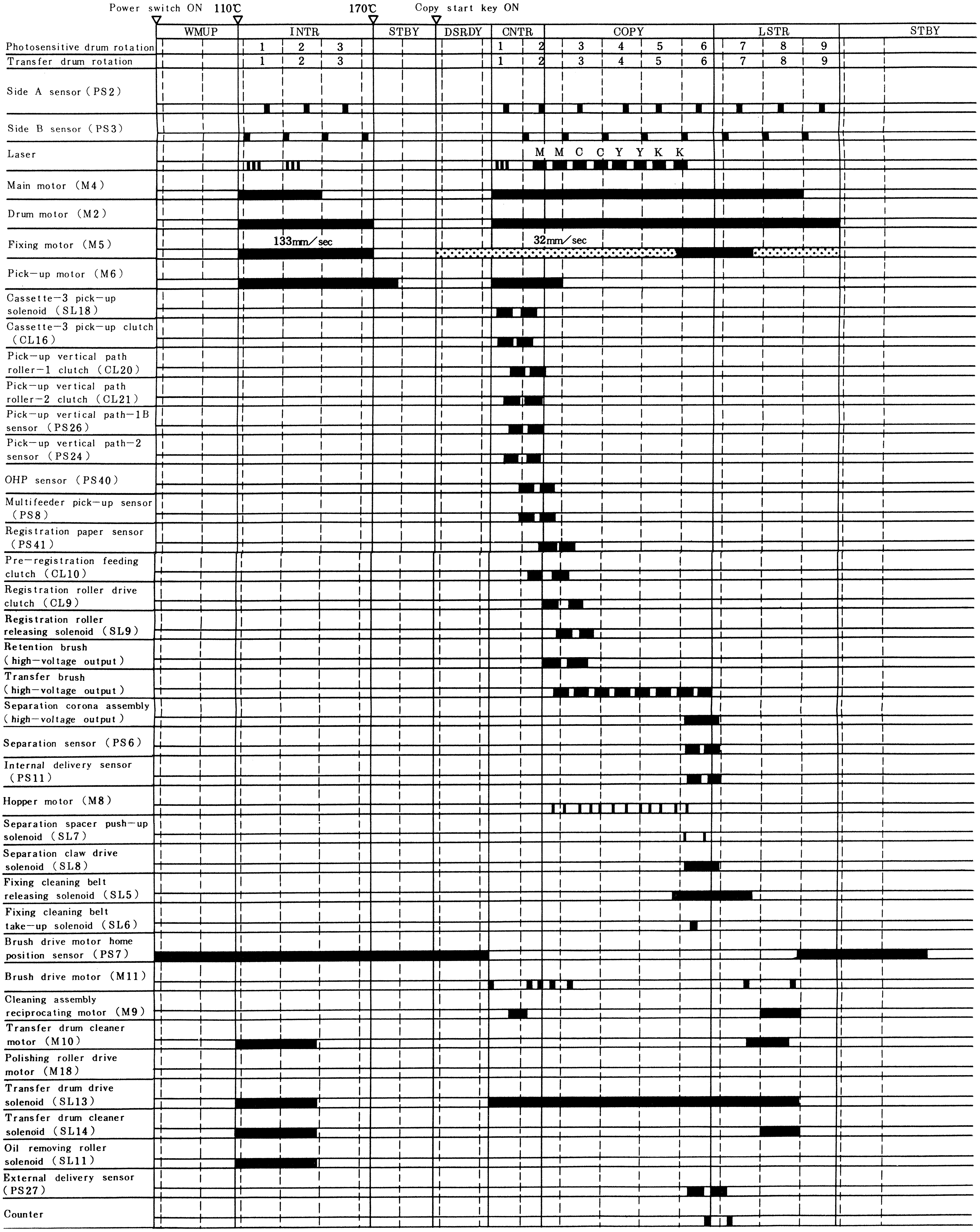
Note 1: Take care not to touch the mirrors and lenses; further, keep the CCD free of dust.
Note 2: Do not touch the laser mirror, and take care not to damage it.

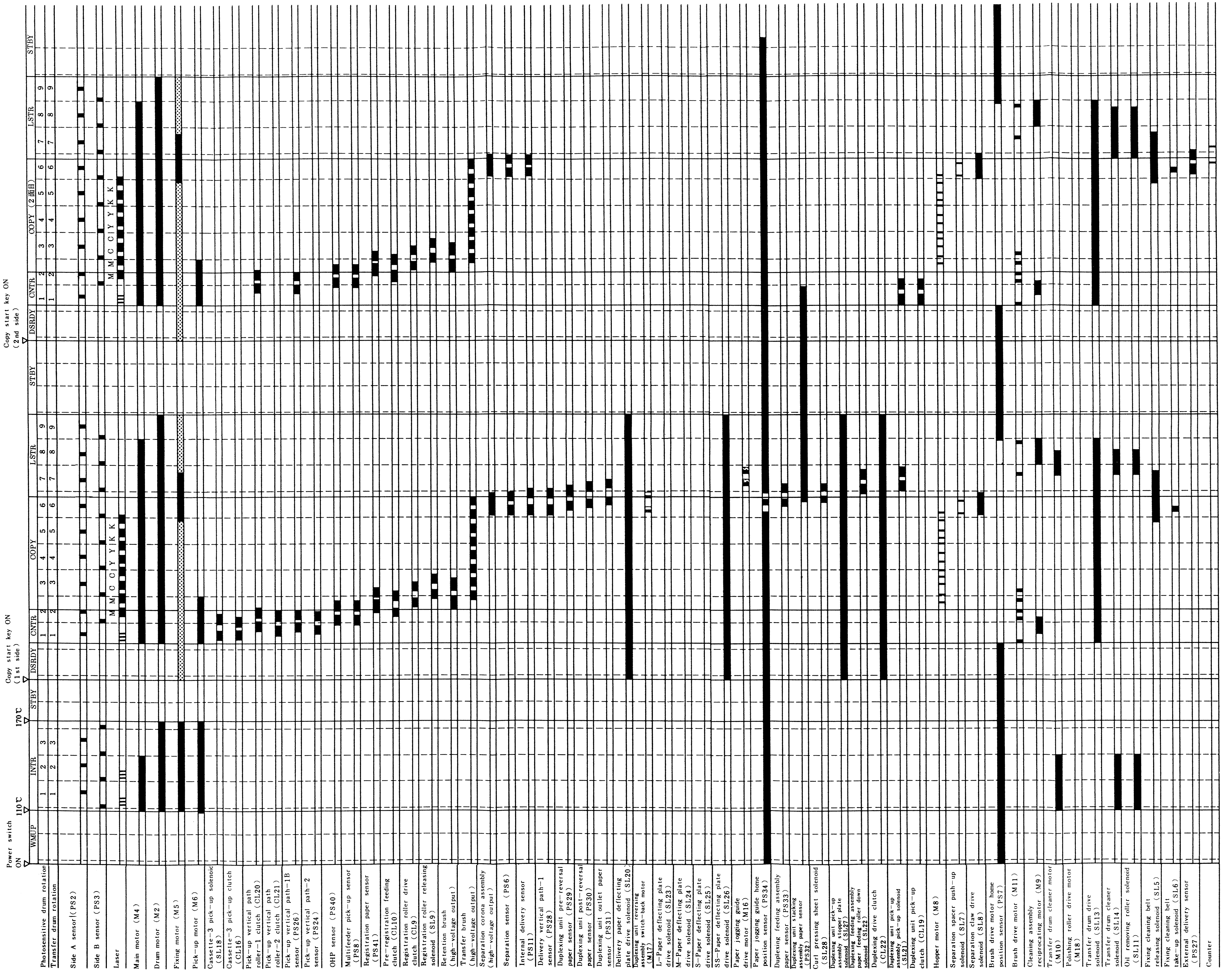
APPENDIX

A. GENERAL TIMING CHART A-1
B. LIST OF SIGNALS AND ABBREVIATIONS A-3
C. GENERAL CIRCUIT DIAGRAM A-9
D. DC CONTROLLER CIRCUIT DIAGRAM A-13
E. READER CONTROLLER CIRCUIT DIAGRAM A-56
F. MAIN POWER SUPPLY CIRCUIT DIAGRAM A-69
G. ANALOG PROCESSOR CIRCUIT DIAGRAM A-74
H. DEVELOPING BIAS CIRCUIT DIAGRAM A-79
I. LASER CONTROLLER CIRCUIT DIAGRAM A-85
J. CCD/CCD DRIVER CIRCUIT DIAGRAM A-89
K. HVT CIRCUIT DIAGRAM A-93
L. CONTROL PANEL RELAY CIRCUIT DIAGRAM A-96
M. TENKEY CIRCUIT DIAGRAM A-98
N. TRANSFER DRIVER CIRCUIT DIAGRAM A-100
O. BD CIRCUIT DIAGRAM A-101
P. ENVIRONMENT MEASURING CIRCUIT DIAGRAM A-102
Q. SPECIAL TOOLS A-103
R. SOLVENS AND OILS LIST A-105

A. GENERAL TIMING CHART

A4/Letter, 2 copies, 4 colors, DIRECT, one-sided, pick-up from cassette 3


Power switch ON
110℃
170℃
Copy start key ON
WMUP
INTR
STBY
DSRDY
CNTR
COPY
LSTR
STBY
Photosensitive drum rotation
Transfer drum rotation
1
2
3
4
5
6
7
8
9
Side A sensor (PS2)
Side B sensor (PS3)
Laser
M M C C Y Y K K
Main motor (M4)
Drum motor (M2)
Fixing motor (M5)
133mm/sec
32mm/sec
Pick-up motor (M6)
Cassette-3 pick-up solenoid (SL18)
Cassette-3 pick-up clutch (CL16)
Pick-up vertical path roller-1 clutch (CL20)
Pick-up vertical path roller-2 clutch (CL21)
Pick-up vertical path-1B sensor (PS26)
Pick-up vertical path-2 sensor (PS24)
OHP sensor (PS40)
Multifeeder pick-up sensor (PS8)
Registration paper sensor (PS41)
Pre-registration feeding clutch (CL10)
Registration roller drive clutch (CL9)
Registration roller releasing solenoid (SL9)
Retention brush (high-voltage output)
Transfer brush (high-voltage output)
Separation corona assembly (high-voltage output)
Separation sensor (PS6)
Internal delivery sensor (PS11)
Hopper motor (M8)
Separation spacer push-up solenoid (SL7)
Separation claw drive solenoid (SL8)
Fixing cleaning belt releasing solenoid (SL5)
Fixing cleaning belt take-up solenoid (SL6)
Brush drive motor home position sensor (PS7)
Brush drive motor (M11)
Cleaning assembly reciprocating motor (M9)
Transfer drum cleaner motor (M10)
Polishing roller drive motor (M18)
Transfer drum drive solenoid (SL13)
Transfer drum cleaner solenoid (SL14)
Oil removing roller solenoid (SL11)
External delivery sensor (PS27)
Counter



A4/Letter, 2 copies, 4 colors, DIRECT, two-sided, pick-up from cassette 3

]

B. LIST OF SIGNALS AND ABBREVIATIONS

1. SIGNALS

A-LEG	A-SIDE SENSOR signal
B-LEG	B-SIDE SENSOR signal
BK-SGNL	BK-TONER DENSITY SENSOR signal
BK-REF	BK-TONER LEVEL SENSOR signal
BMTRHP	BRUSH LOCKING/RELEASING MOTOR HP SENSOR signal
C-SGNL	C-TONER DENSITY SENSOR signal
C1LFU	CASSETTE-1 LIFTER SENSOR signal
C1PD	CASSETTE-1 PAPER SENSOR signal
C1PW	CASSETTE-1 PAPER WIDTH VR signal
C2LFU	CASSETTE-2 LIFTER SENSOR signal (CLC700)
C2PD	CASSETTE-2 PAPER SENSOR signal (CLC700)
C2PUDC	CASSETTE-2 PICK-UP ASSEMBLY DOOR SWITCH signal (CLC700)
C2PW	CASSETTE-2 PAPER WIDTH VR signal (CLC700)
C2SZ0 (LEFT)	CASSETTE-2 PAPER LENGTH SENSOR UNIT signal 0 (CLC700)
C2SZ1 (RIGHT)	CASSETTE-2 PAPER LENGTH SENSOR UNIT signal 1 (CLC700)
C3LFU	CASSETTE-3 LIFTER SENSOR signal (CLC800)
C3PD	CASSETTE-3 PAPER SENSOR signal (CLC800)
C3PW	CASSETTE-3 PAPER WIDTH VR signal (CLC800)
C3SZ0 (LEFT)	CASSETTE-3 PAPER LENGTH SENSOR UNIT signal 0 (CLC800)
C3SZ1 (RIGHT)	CASSETTE-3 PAPER LENGTH SENSOR UNIT signal 1 (CLC800)
C4LFU	CASSETTE-4 LIFTER SENSOR signal (CLC800)
C4PD	CASSETTE-4 PAPER SENSOR signal (CLC800)
C4PW	CASSETTE-4 PAPER WIDTH VR signal (CLC800)
C4SZ0 (LEFT)	CASSETTE-4 PAPER LENGTH SENSOR UNIT signal 0 (CLC800)
C4SZ1 (RIGHT)	CASSETTE-4 PAPER LENGTH SENSOR UNIT signal 1 (CLC800)
CL1D* (DEV_M_CL)	M-DEVELOPING CYLINDER CLUTCH command
CL2D* (DEV_C_CL)	C-DEVELOPING CYLINDER CLUTCH command
CL3D* (DEV_Y_CL)	Y-DEVELOPING CYLINDER CLUTCH command
CL4D* (DEV_BK_CL)	BK-DEVELOPING CYLINDER CLUTCH command
CL5D* (TONER_M)	M-TONER SUPPLY CLUTCH command
CL6D* (TONER_C)	C-TONER SUPPLY CLUTCH command
CL7D* (TONER_Y)	Y-TONER SUPPLY CLUTCH command
CL8D* (TONER_BK)	BK-TONER SUPPLY CLUTCH command
CL9D*	REGISTRATION ROLLER DRIVE CLUTCH command
CL10D*	PRE-REGISTRATION FEEDER CLUTCH command
CL11D*	PRE-REGISTRATION ROLLER 2 CLUTCH command
CL12D* (MF_CL)	MULTIFEEDER PICK-UP CLUTCH command

CL13D* (C1_PF_CL)	CASSETTE-1 PICK-UP CLUTCH command
CL14D* (C2_PF_CL)	CASSETTE-2 PICK-UP CLUTCH command (CLC700)
CL15D*	VERTICAL PATH-1 CLUTCH command (CLC700)
CL16D* (C3_PF_CL)	CASSETTE-3 PICK-UP CLUTCH command (CLC800)
CL17D* (C4_PF_CL)	CASSETTE-4 PICK-UP CLUTCH command (CLC800)
CL18D*	VERTICAL PATH-3 CLUTCH command (CLC800)
CL19D* (RE_PF_CL)	DUPLEXING PICK-UP CLUTCH command (CLC800)
CL20D*	VERTICAL PATH-1 CLUTCH command (CLC800)
CL21D*	VERTICAL PATH-2 CLUTCH command (CLC700)
CL22D*	DUPLEXING DRIVE CLUTCH command (CLC800)
CL23D*	DELIVERY VERTICAL PATH-2 CLUTCH command (CLC800)
CNT1D*	COUNTER-2 command
CNT2D*	COUNTER-2 command
CNT3D*	COUNTER-3 command
CNT4D*	COUNTER-4 command
CTEP*	C-TONER LEVEL SENSOR signal
DELDC	DELIVERY DOOR SENSOR signal
DRHOFF	DRUM HEATER command
DRUMHP	PHOTOSENSITIVE DRUM HOME POSITION SENSOR signal
FM1D*	SCANNING LAMP COOLING FAN-1 command
FM2D*	PRIMARY CORONA ASSEMBLY EXHAUST FAN command
FM3D*	FIXING EXHAUST FAN command
FM4D*	OZONE SUCTION FAN-1 command
FM5D*	SCANNING LAMP COOLING FAN-2 command
FM6D*	SCANNING LAMP COOLING FAN-3 command
FM7D*	SCANNING LAMP COOLING FAN-4 command
FM8D*	POWER SUPPLY COOLING FAN command
FM9D*	IP COOLING FAN command
FM10D*	POWER UNIT FAN-1 command
FM12D*	DEVELOPING BIAS PCB COOLING FAN command
FM13D*	OZONE SUCTION FAN-2 command
FM14D*	FEEDER FAN-1 command
FM15-D*	FEEDER FAN-2 command
HUM	ENVIRONMENT SENSOR HUMIDITY signal
HVATC	ATTRACTION BRUSH ON/OFF CONTROL signal
HVATI	ATTRACTION BRUSH LEVEL CONTROL signal
HVGI	GRID BIAS LEVEL CONTROL signal
HVPR*	PRIMARY CORONA CURRENT ON/OFF signal
HVSPC	SEPARATION CORONA ON/OFF CONTROL signal
HVSPI	SEPARATION CORONA LEVEL CONTROL signal
HVTRC	TRANSFER CORONA ON/OFF CONTROL signal
HVTRI	TRANSFER CORONA LEVEL CONTROL signal

I-REM	INTERNAL STATIC ELIMINATOR ON/OFF CONTROL signal
KEYSW	KEY SWITCH signal
LAON*	SCANNING LAMP ON signal
LA2ON*	PRE-EXPOSURE LAMP ON signal
LDC (LEFT_TDR)	LEFT DOOR SENSOR signal
M-SGNL	M-TONER DENSITY SENSOR signal
M2CLK	DRUM MOTOR ROTATION SPEED signal
M2ON* (DRMD)	DRUM MOTOR command
M2RDY* (DRMRDY)	DRUM MOTOR READY signal
M2SPD0	DRUM MOTOR SPEED CONTROL signal 0
M2SPD1	DRUM MOTOR SPEED CONTROL signal 1
M3IDL (LSMSPD)	LASER SCANNER MOTOR IDLE signal
M3ON* (LSMD)	LASER SCANNER MOTOR command
M3RDY* (LSMRDY)	LASER SCANNER MOTOR READY signal
M40N* (MMON)	MAIN MOTOR command
M4RDY* (MMRDY)	MAIN MOTOR READY signal
M5ON* (FXMD)	FIXING MOTOR command
M5RDY* (FXMRDY)	FIXING MOTOR READY signal
M5SPD0	FIXING MOTOR SPEED CONTROL signal 0
M5SPD1	FIXING MOTOR SPEED CONTROL signal 1
M6ON*	PICK-UP MOTOR command
M6RDY*	PICK-UP MOTOR READY signal
M7FW (M7D1)	PRIMARY CORONA WIRE CLEANING MOTOR NORMAL DRIVE command
M7RV (M7D0)	PRIMARY CORONA WIRE CLEANING MOTOR REVERSE DRIVE command
M8D(+)/M8D(–)	HOPPER MOTOR command
M9D(+)/M9D(–)	CLEANING ASSEMBLY RECIPROCATING MOTOR command
M10ON* (TDCLAMD)	TRANSFER DRUM CLEANER MOTOR command
M11_A/M11_B	BRUSH LOCKING/RELEASING MOTOR command
M12ON	CASSETTE1 LIFTER MOTOR command
M13ON	CASSETTE2 LIFTER MOTOR command (CLC700)
M14ON	CASSETTE3 LIFTER MOTOR command (CLC800)
M15ON	CASSETTE4 LIFTER MOTOR command (CLC800)
M16_A/M16_B	PAPER JOGGING GUIDE DRIVE MOTOR command (CLC800)
M17_A/M17_B	DUPLEXING UNIT REVERSING ASSEMBLY SWITCH-BACK MOTOR command (CLC800)
M18_A/M18_B (M18ON)	POLISHING ROLLER DRIVE MOTOR command
MFPD	MULTIFEEDER PAPER SENSOR signal
MFPPD*	MULTIFEEDER PICK-UP SENSOR signal
MFPW	MULTIFEEDER PAPER WIDTH VR signal
MTEP*	M-TONER LEVEL SENSOR signal

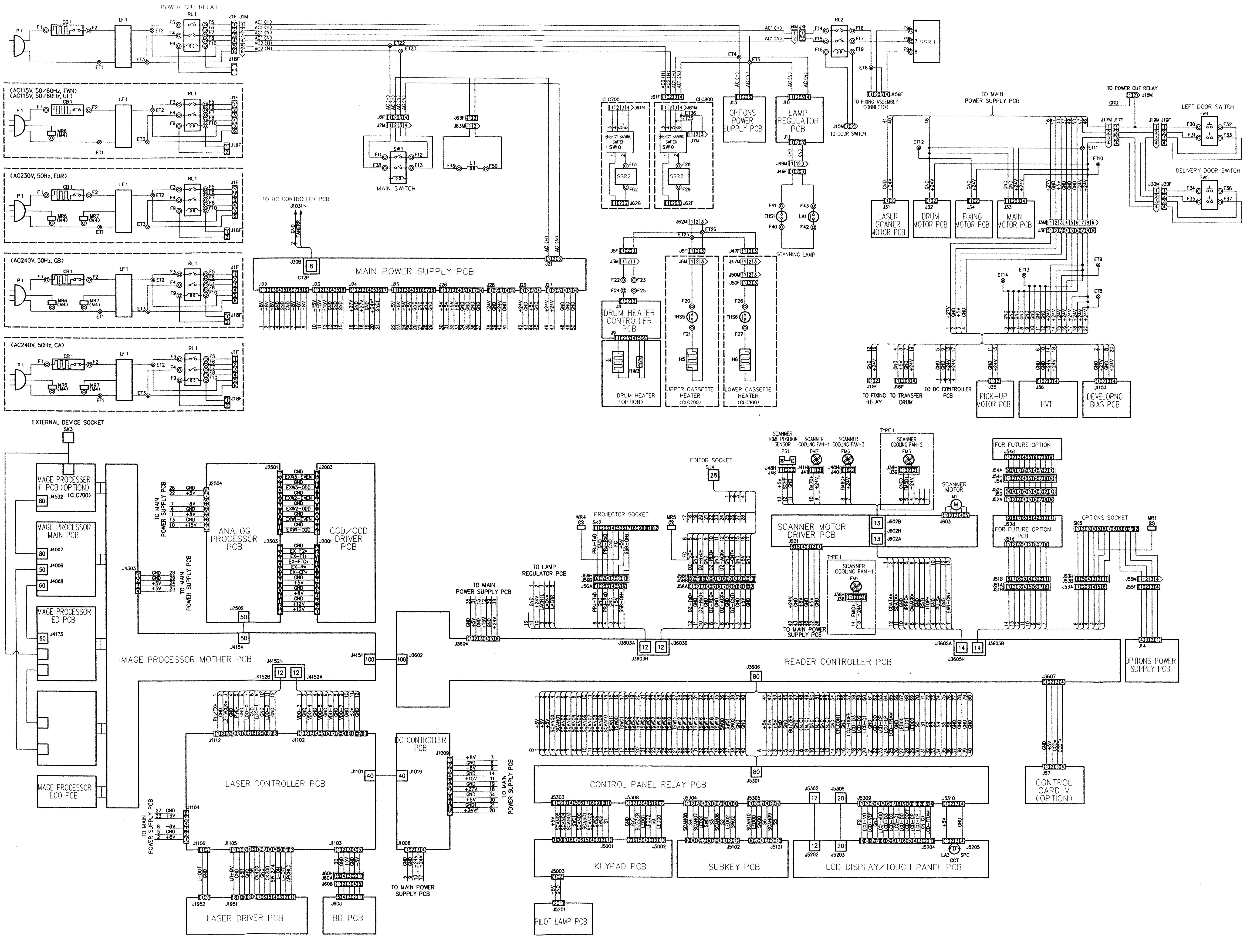
O-REM	EXTERNAL STATIC ELIMINATER ON/OFF CONTROL signal
OEP* (OILEP)	OIL LEVEL SENSOR signal
OHPD (OHP)	OHP SENSOR signal
PGHP	PAPER JOGGING GUIDE HOME POSITION SENSOR signal (CLC800)
PS4D (TRNS_1)	PRE-TRANSFER PAPER SENSOR signal
PS5D (TRNS_2)	POST-TRANSFER PAPER SENSOR signal
PS6D (SPRT)	SEPARATION SENSOR signal
PS11D (DLVRY_I)	INTERNAL DELIVERY SENSOR signal
PS19D	PICK-UP VERTICAL PATH-1 SENSOR signal (CLC700)
PS24D	PICK-UP VERTICAL PATH-2 SENSOR signal (CLC800)
PS25D	PICK-UP VERTICAL PATH-3 SENSOR signal (CLC800)
PS26D	PICK-UP VERTICAL PATH-1B SENSOR signal (CLC800)
PS27D (DLVRY_O)	EXTERNAL DELIVERY SENSOR signal
PS28D	DELIVERY VERTICAL PATH SENSOR signal (CLC800)
PS29D (REV_BF)	DUPLEXING UNIT PRE-REVERSAL PAPER signal SENSOR (CLC800)
PS30D (REV_AFT)	DUPLEXING UNIT POST-REVERSAL PAPER SENSOR signal (CLC800)
PS31D (REV_EXIT)	DUPLEXING UNIT REVERSAL OUTLET PAPER SENSOR signal (CLC800)
PS32D (DUP_PD)	DUPLEXING UNIT STACKING ASSEMBLY PAPER SENSOR signal (CLC800)
PS33D	DUPLEXING UNIT FEEDER PAPER SENSOR signal (CLC800)
PS39D	DUPLEXING UNIT REVERSING ASSEMBLY DOOR SENSOR signal (CLC800)
PS41D (RGST)	REGISTRATION PAPER SENSOR signal
RS43D (FOR FUTURE, TYPE 2 ONLY)	PRE-PHOTOSENSITIVE DRUM PAPER SENSOR signal
PWOFF	MAIN SWITCH signal
RDC (RGHT_DR)	RIGHT DOOR SENSOR signal
RVDC (REV_DR)	DUPLEXING UNIT REVERSING ASSEMBLY DOOR SWITCH signal (CLC800)
RVPUDC (FEED_DR)	DUPLEXING UNIT PICK-UP DOOR SWITCH signal (CLC800)
SCHP	SCANNER HOME POSITION SENSOR signal
SL1D*	M-DEVELOPING ASSEMBLY ENGAGING SOLENOID command
SL2D*	C-DEVELOPING ASSEMBLY ENGAGING SOLENOID command
SL3D*	Y-DEVELOPING ASSEMBLY ENGAGING SOLENOID command
SL4D*	K-DEVELOPING ASSEMBLY ENGAGING SOLENOID command
SL5D* (WEB_SWNG)	CLEANING WEB RELEASING SOLENOID command
SL6D* (WEB_WIND)	CLEANING WEB TAKE-UP SOLENOID command
SL7D*	SEPARATION SPACER PUSH-UP SOLENOID command
SL8D* (SPRT)	SEPARATION CLAW DRIVE SOLENOID command
SL9D*	REGISTRATION ROLLER RELEASING SOLENOID command
SL10D*	RETENTION GUIDE DRIVE SOLENOID command
SL11D* (OIL_CLRR)	OIL REMOVING ROLLER SOLENOID command

SL12D* (OIL_PMP)	OIL PUMP DRIVE SOLENOID command
SL13D*	TRANSFER DRUM LOCKING/RELEASING SOLENOID command
SL14D*	TRANSFER DRUM CLEANER SOLENOID command
SL15D*	MULTIFEEDER PICK-UP SOLENOID command
SL16D* (C1_PU_SL)	CASSETTE-1 PICK-UP SOLENOID command
SL17D* (C2_PU_SL)	CASSETTE-2 PICK-UP SOLENOID command (CLC700)
SL18D* (C3_PU_SL)	CASSETTE-3 PICK-UP SOLENOID command (CLC800)
SL19D* (C4_PU_SL)	CASSETTE-4 PICK-UP SOLENOID command (CLC800)
SL20D* (DEL_FLP)	DELIVERY PAPER DEFLECTOR DRIVE SOLENOID command (CLC800)
SL21D* (DU_PU_SL)	ASSEMBLY PICK-UP SOLENOID command (CLC800)
SL22D*	DUPLEXING UNIT PICK-UP ASSEMBLY PAPER FEEDING ROLLER SOLENOID command
SL23D* (DP_L_FLP)	L-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800)
SL24D* (DP_M_FLP)	M-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800)
SL25D* (DP_S_FLP)	S-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800)
SL26D* (DP_SS_FLP)	SS-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800)
SL27DD	DUPLEXING UNIT PICK-UP ASSEMBLY STOP PLATE DRIVE SOLENOID DOWN command
SL27DU	DUPLEXING UNIT PICK-UP ASSEMBLY STOP PLATE DRIVE SOLENOID UP command
SL28D*	CURL PRESSING SHEET SOLENOID command
TEMP	ENVIRONMENT SENSOR TEMPERATURE signal
THM1	UPPER FIXING ROLLER TEMPERATURE signal
THM2	LOWER FIXING ROLLER TEMPERATURE signal
UHON	UPPER FIXING HEATER command
WEBD	FIXING ROLLER CLEANING WEB SENSOR signal
WTBD	WASTE TONER FEEDING SCREW LOCK DETECTING SWITCH signal
WTONER	WASTE TONER FULL SENSOR signal
Y-SGNL	Y-TONER DENSITY SENSOR signal
YTEP*	Y-TONER LEVEL SENSOR signal

2. LIST OF ABBREVIATIONS

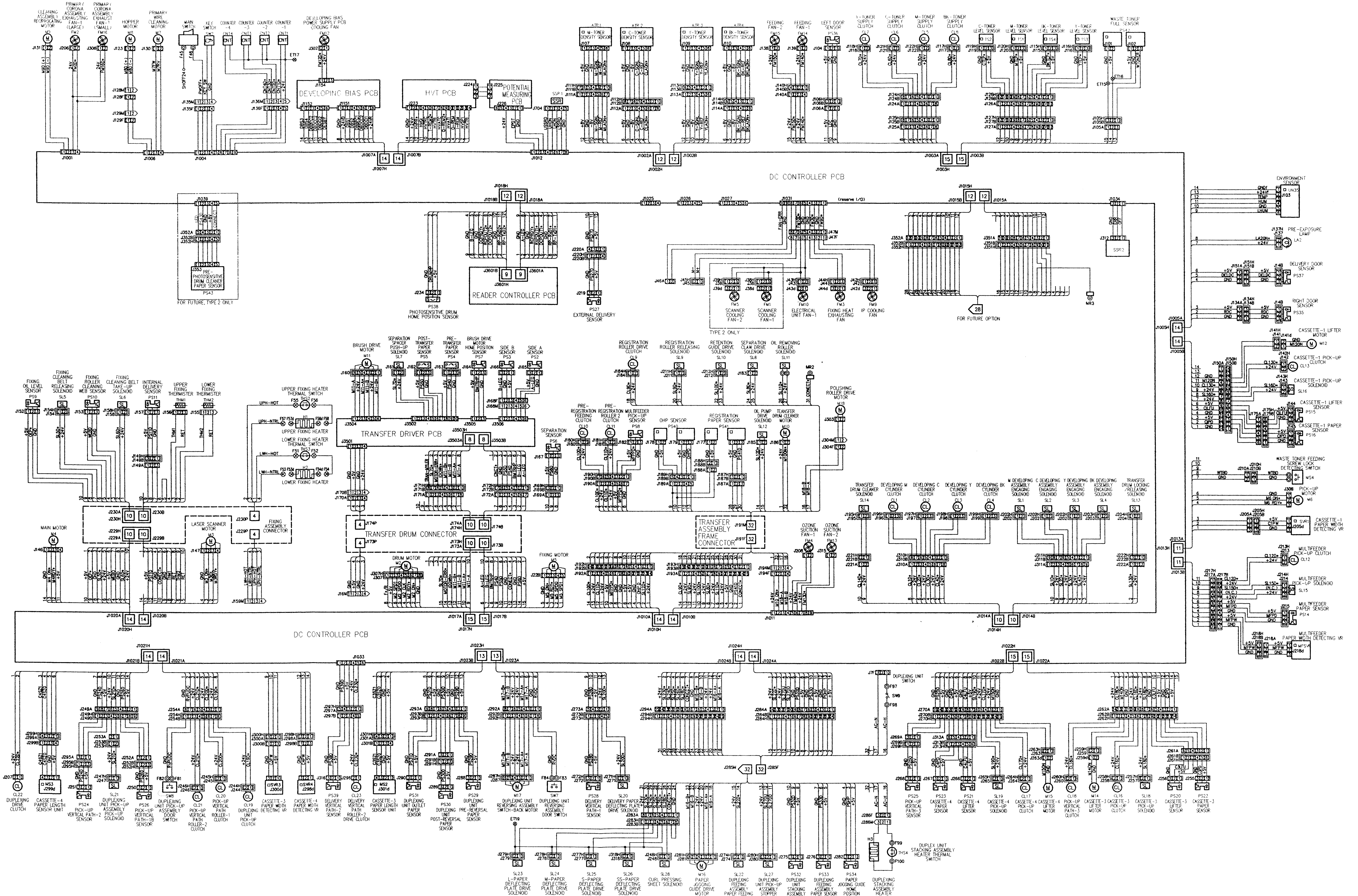
CNTR	CONTROL ROTATION
COPY	COPY
DSRDY	SCANNER READY
INTR	INITIAL ROTATION
LSTR	LAST ROTATION
STBY	STANDBY
WMPU	WARM UP

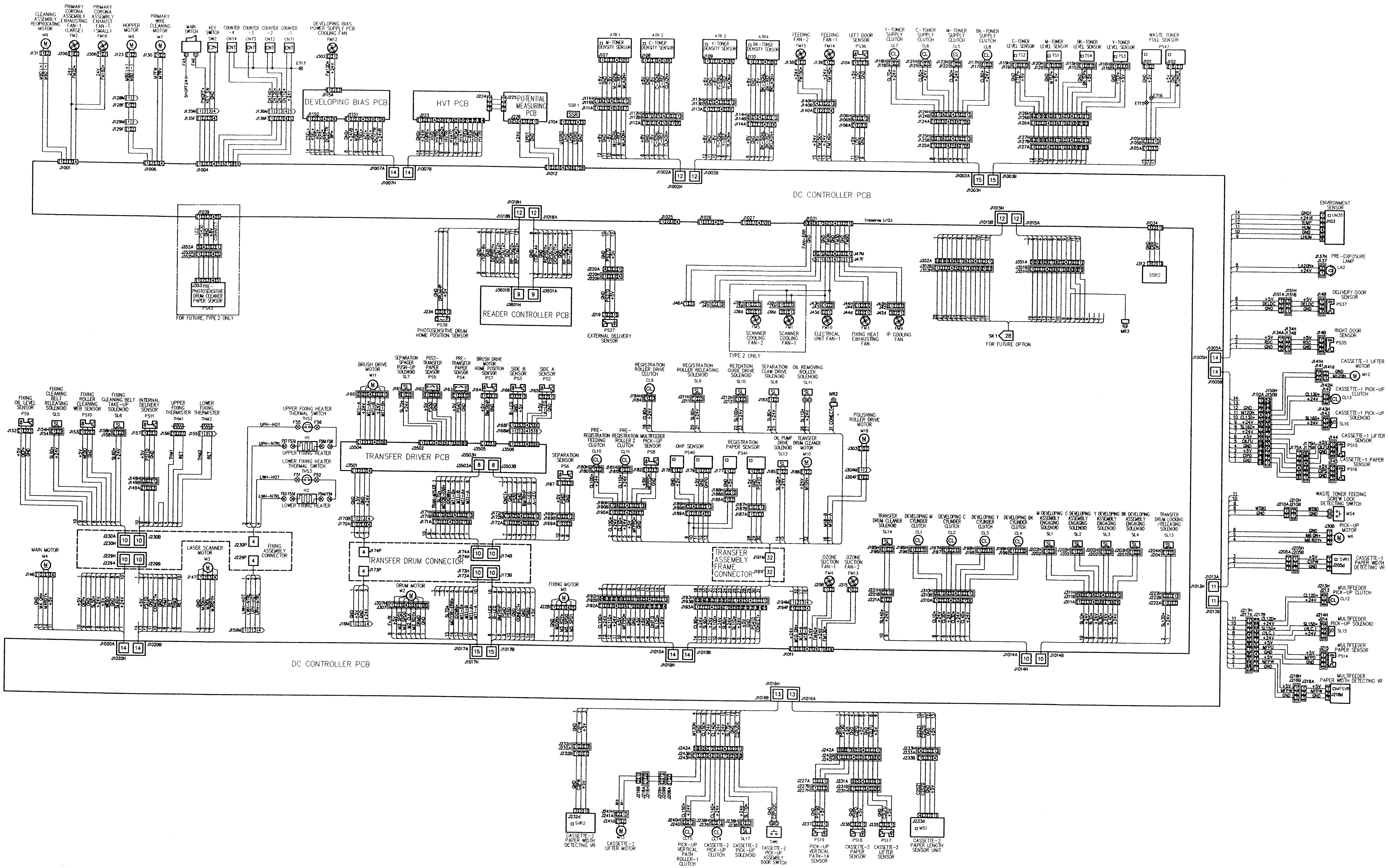
General circuit diagram (1/3)



POWER CUT RELAY
RL1
CB1
LF1
P1
ET1
ET2
ET3
J1F
J1M
J1BF
AC1 (H)
AC1 (N)
AC2 (H)
AC2 (N)
(AC115V, 50/60Hz, TWN)
(AC115V, 50/60Hz, UL)
(AC230V, 50Hz, EUR)
(AC240V, 50Hz, GB)
(AC240V, 50Hz, CA)
NR6 (M4)
NR7 (M4)
ET22
ET23
SW1
MAIN SWITCH
L1
TO DC CONTROLLER PCB
J1031
MAIN POWER SUPPLY PCB
J308
CT2P
J21
J22
J23
J24
J25
J26
J28
J29
J27
CLC700
CLC800
ENERGY SAVING SWITCH
SW10
SSR2
OPTIONS POWER SUPPLY PCB
LAMP REGULATOR PCB
SCANNING LAMP
THS1
LA1
RL2
SSR1
TO FIXING ASSEMBLY CONNECTOR
TO DOOR SWITCH
DRUM HEATER CONTROLLER PCB
DRUM HEATER (OPTION)
UPPER CASSETTE HEATER (CLC700)
LOWER CASSETTE HEATER (CLC800)
THS5
THS6
H4
H5
H6
TO MAIN POWER SUPPLY PCB
TO POWER CUT RELAY
LEFT DOOR SWITCH
SW4
DELIVERY DOOR SWITCH
SW5
LASER SCANER MOTOR PCB
DRUM MOTOR PCB
FIXING MOTOR PCB
MAIN MOTOR PCB
J31
J32
J34
J33
TO FIXING RELAY
TO TRANSFER DRUM
TO DC CONTROLLER PCB
PICK-UP MOTOR PCB
HVT
DEVELOPNG BIAS PCB
J35
J36
J1153
EXTERNAL DEVICE SOCKET
SK3
IMAGE PROCESSER IF PCB (OPTION) (CLC700)
IMAGE PROCESSOR MAIN PCB
IMAGE PROCESSOR ED PCB
IMAGE PROCESSOR ECO PCB
ANALOG PROCESSOR PCB
CCD/CCD DRIVER PCB
IMAGE PROCESSOR MOTHER PCB
LASER CONTROLLER PCB
LASER DRIVER PCB
BD PCB
DC CONTROLLER PCB
TO MAIN POWER SUPPLY PCB
EDITOR SOCKET
SK4
PROJECTOR SOCKET
SK2
TO LAMP REGULATOR PCB
SCANNER HOME POSITION SENSOR
PS1
SCANNER COOLING FAN-4
FM7
SCANNER COOLING FAN-3
FM6
TYPE 1
SCANNER COOLING FAN-2
FM5
SCANNER MOTOR
M1
SCANNER MOTOR DRIVER PCB
SCANNER COOLING FAN-1
FM1
FOR FUTURE OPTION
FOR FUTURE OPTION PCB
OPTIONS SOCKET
SK5
MR1
MR4
MR5
READER CONTROLLER PCB
OPTIONS POWER SUPPLY PCB
CONTROL PANEL RELAY PCB
CONTROL CARD V (OPTION)
KEYPAD PCB
SUBKEY PCB
LCD DISPLAY/TOUCH PANEL PCB
PILOT LAMP PCB
LA3
SPC
CCT

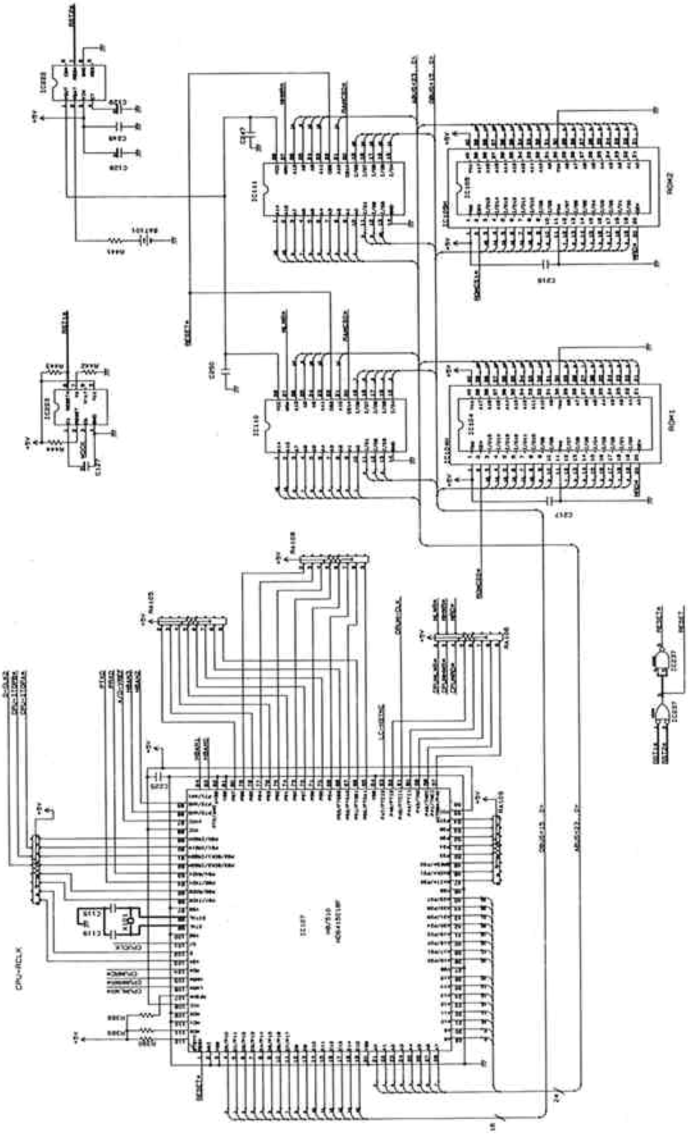
General circuit diagram (2/3)


DC CONTROLLER PCB
DEVELOPING BIAS PCB
HVT PCB
POTENTIAL MEASURING PCB
READER CONTROLLER PCB
TRANSFER DRIVER PCB
TRANSFER DRUM CONNECTOR
TRANSFER ASSEMBLY FRAME CONNECTOR
FIXING ASSEMBLY CONNECTOR
MAIN MOTOR
LASER SCANNER MOTOR
DRUM MOTOR
FIXING MOTOR
BRUSH DRIVE MOTOR
UPPER FIXING HEATER
LOWER FIXING HEATER
UPPER FIXING HEATER THERMAL SWITCH
LOWER FIXING HEATER THERMAL SWITCH
ENVIRONMENT SENSOR
PRE-EXPOSURE LAMP
DELIVERY DOOR SENSOR
RIGHT DOOR SENSOR
CASSETTE-1 LIFTER MOTOR
CASSETTE-1 PICK-UP CLUTCH
CASSETTE-1 PICK-UP SOLENOID
CASSETTE-1 LIFTER SENSOR
CASSETTE-1 PAPER SENSOR
WASTE TONER FEEDING SCREW LOCK DETECTING SWITCH
PICK-UP MOTOR
CASSETTE-1 PAPER WIDTH DETECTING VR
MULTIFEEDER PICK-UP CLUTCH
MULTIFEEDER PICK-UP SOLENOID
MULTIFEEDER PAPER SENSOR
MULTIFEEDER PAPER WIDTH DETECTING VR
PHOTOSENSITIVE DRUM HOME POSITION SENSOR
EXTERNAL DELIVERY SENSOR
PRE-PHOTOSENSITIVE DRUM CLEANER PAPER SENSOR
FOR FUTURE, TYPE 2 ONLY
TYPE 2 ONLY
FOR FUTURE OPTION
SCANNER COOLING FAN-2
SCANNER COOLING FAN-1
ELECTRICAL UNIT FAN-1
FIXING HEAT EXHAUSTING FAN
IP COOLING FAN
OZONE SUCTION FAN-1
OZONE SUCTION FAN-2
POLISHING ROLLER DRIVE MOTOR
DUPLEXING UNIT SWITCH
DUPLEX UNIT STACKING ASSEMBLY HEATER THERMAL SWITCH
DUPLEXING STACKING ASSEMBLY HEATER
(reserve I/O)

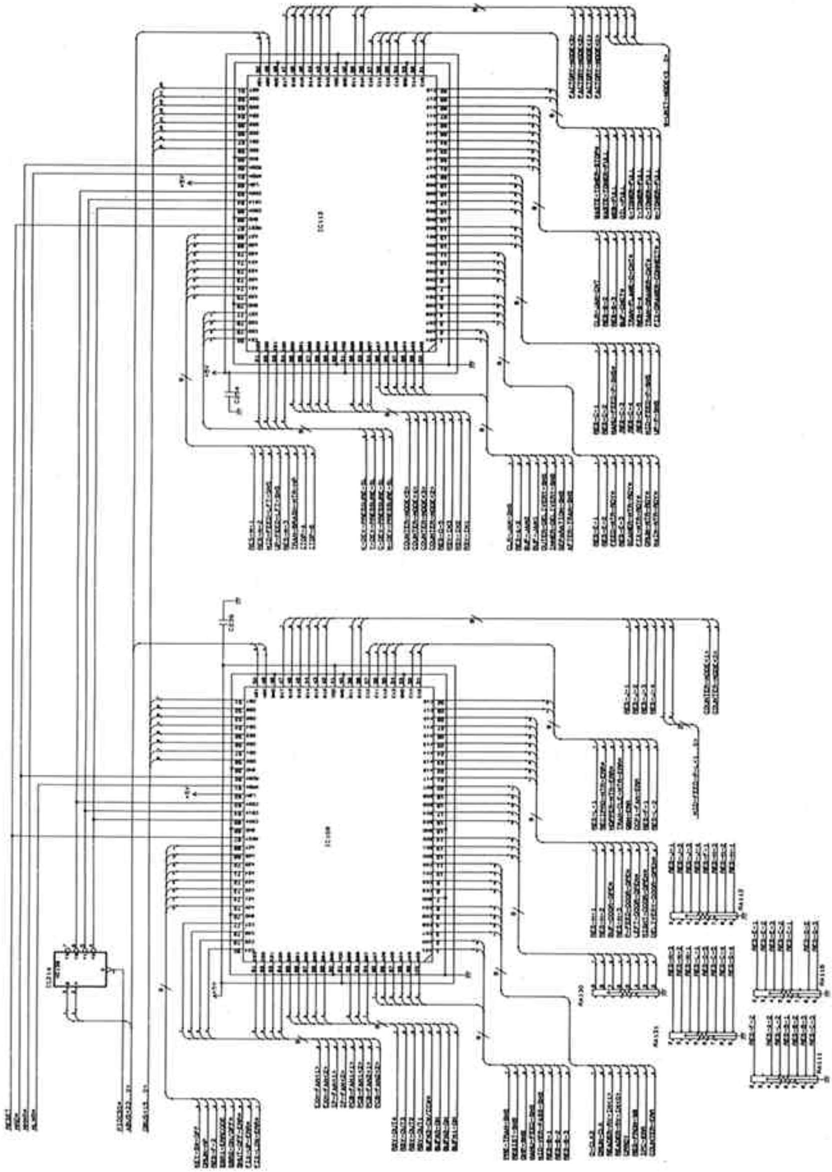

CLEANING ASSEMBLY RECIPROCATING MOTOR M9
PRIMARY CORONA ASSEMBLY EXHAUSTING FAN-1 (LARGE) FM2
PRIMARY CORONA ASSEMBLY EXHAUST FAN-1 (SMALL) FM16
HOPPER MOTOR M8
PRIMARY WIRE CLEANING MOTOR M7
MAIN SWITCH
KEY SWITCH SW2
COUNTER -4 CNT4
COUNTER -3 CNT3
COUNTER -2 CNT2
COUNTER -1 CNT1
DEVELOPING BIAS POWER SUPPLY PCB COOLING FAN FM12
DEVELOPING BIAS PCB
HVT PCB
POTENTIAL MEASURING PCB
SSR1
ATR1 M-TONER DENSITY SENSOR
ATR2 C-TONER DENSITY SENSOR
ATR3 Y-TONER DENSITY SENSOR
ATR4 BK-TONER DENSITY SENSOR
FEEDING FAN-2 FM15
FEEDING FAN-1 FM14
LEFT DOOR SENSOR PS36
Y-TONER SUPPLY CLUTCH CL7
C-TONER SUPPLY CLUTCH CL6
M-TONER SUPPLY CLUTCH CL5
BK-TONER SUPPLY CLUTCH CL8
C-TONER LEVEL SENSOR TS2
M-TONER LEVEL SENSOR TS1
BK-TONER LEVEL SENSOR TS4
Y-TONER LEVEL SENSOR TS3
WASTE TONER FULL SENSOR PS42
DC CONTROLLER PCB
PRE-PHOTOSENSITIVE DRUM CLEANER PAPER SENSOR PS43
FOR FUTURE, TYPE 2 ONLY
PHOTOSENSITIVE DRUM HOME POSITION SENSOR PS38
READER CONTROLLER PCB
EXTERNAL DELIVERY SENSOR PS27
(reserve I/O)
SCANNER COOLING FAN-2 FM5
SCANNER COOLING FAN-1 FM1
ELECTRICAL UNIT FAN-1 FM10
FIXING HEAT EXHAUSTING FAN FM3
IP COOLING FAN FM9
TYPE 2 ONLY
SSR2
MR3
FOR FUTURE OPTION
ENVIRONMENT SENSOR
PRE-EXPOSURE LAMP LA2
DELIVERY DOOR SENSOR PS37
RIGHT DOOR SENSOR PS35
CASSETTE-1 LIFTER MOTOR M12
CASSETTE-1 PICK-UP CLUTCH CL13
CASSETTE-1 PICK-UP SOLENOID SL16
CASSETTE-1 LIFTER SENSOR PS15
CASSETTE-1 PAPER SENSOR PS16
WASTE TONER FEEDING SCREW LOCK DETECTING SWITCH MS4
PICK-UP MOTOR M6
CASSETTE-1 PAPER WIDTH DETECTING VR
MULTIFEEDER PICK-UP CLUTCH CL12
MULTIFEEDER PICK-UP SOLENOID SL15
MULTIFEEDER PAPER SENSOR PS14
MULTIFEEDER PAPER WIDTH DETECTING VR
FIXING OIL LEVEL SENSOR PS9
FIXING CLEANING BELT RELEASING SOLENOID SL5
FIXING ROLLER CLEANING WEB SENSOR PS10
FIXING CLEANING BELT TAKE-UP SOLENOID SL6
INTERNAL DELIVERY SENSOR PS11
UPPER FIXING THERMISTER THM1
LOWER FIXING THERMISTER THM2
UPPER FIXING HEATER THERMAL SWITCH THS2
UPPER FIXING HEATER H1
LOWER FIXING HEATER THERMAL SWITCH THS3
LOWER FIXING HEATER H2
BRUSH DRIVE MOTOR M11
SEPARATION SPACER PUSH-UP SOLENOID SL7
POST-TRANSFER PAPER SENSOR PS5
PRE-TRANSFER PAPER SENSOR PS4
BRUSH DRIVE MOTOR HOME POSITION SENSOR PS7
SIDE B SENSOR PS3
SIDE A SENSOR PS2
TRANSFER DRIVER PCB
SEPARATION SENSOR PS6
FIXING ASSEMBLY CONNECTOR
LASER SCANNER MOTOR M3
MAIN MOTOR M4
TRANSFER DRUM CONNECTOR
DRUM MOTOR M2
FIXING MOTOR M5
REGISTRATION ROLLER DRIVE CLUTCH CL9
REGISTRATION ROLLER RELEASING SOLENOID SL9
RETENTION GUIDE DRIVE SOLENOID SL10
SEPARATION CLAW DRIVE SOLENOID SL8
OIL REMOVING ROLLER SOLENOID SL11
MR2
POLISHING ROLLER DRIVE MOTOR M18
PRE-REGISTRATION FEEDING CLUTCH CL10
PRE-REGISTRATION ROLLER 2 CLUTCH CL11
MULTIFEEDER PICK-UP SENSOR PS8
OHP SENSOR PS40
REGISTRATION PAPER SENSOR PS41
OIL PUMP DRIVE SOLENOID SL12
TRANSFER DRUM CLEANER MOTOR M10
TRANSFER ASSEMBLY FRAME CONNECTOR
OZONE SUCTION FAN-1 FM4
OZONE SUCTION FAN-2 FM13
TRANSFER DRUM CLEANER SOLENOID SL14
DEVELOPING M CYLINDER CLUTCH CL1
DEVELOPING C CYLINDER CLUTCH CL2
DEVELOPING Y CYLINDER CLUTCH CL3
DEVELOPING BK CYLINDER CLUTCH CL4
M DEVELOPING ASSEMBLY ENGAGING SOLENOID SL1
C DEVELOPING ASSEMBLY ENGAGING SOLENOID SL2
Y DEVELOPING ASSEMBLY ENGAGING SOLENOID SL3
BK DEVELOPING ASSEMBLY ENGAGING SOLENOID SL4
TRANSFER DRUM LOCKING /RELEASING SOLENOID SL13
DC CONTROLLER PCB
CASSETTE-2 PAPER WIDTH DETECTING VR
CASSETTE-2 LIFTER MOTOR M13
PICK-UP VERTICAL PATH ROLLER-1 CLUTCH CL15
CASSETTE-2 PICK-UP CLUTCH CL14
CASSETTE-2 PICK-UP SOLENOID SL17
CASSETTE-2 PICK-UP ASSEMBLY DOOR SWITCH SW6
PICK-UP VERTICAL PATH-1A SENSOR PS19
CASSETTE-2 PAPER SENSOR PS18
CASSETTE-2 LIFTER SENSOR PS17
CASSETTE-2 PAPER LENGTH SENSOR UNIT MS1

D. DC CONTROLLER CIRCUIT DIAGRAM

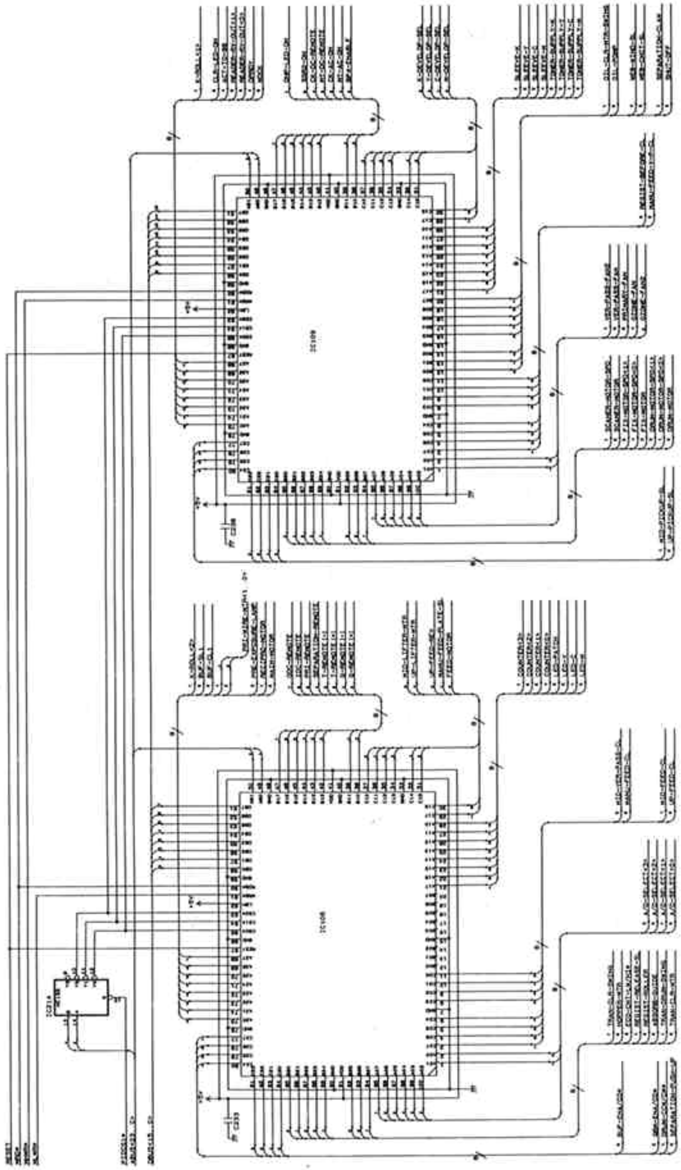
DC controller circuit diagram (CLC700) (1/21)


ROM2
ROM1
IC111
IC110
IC107
H8/510
CPU-RCLK

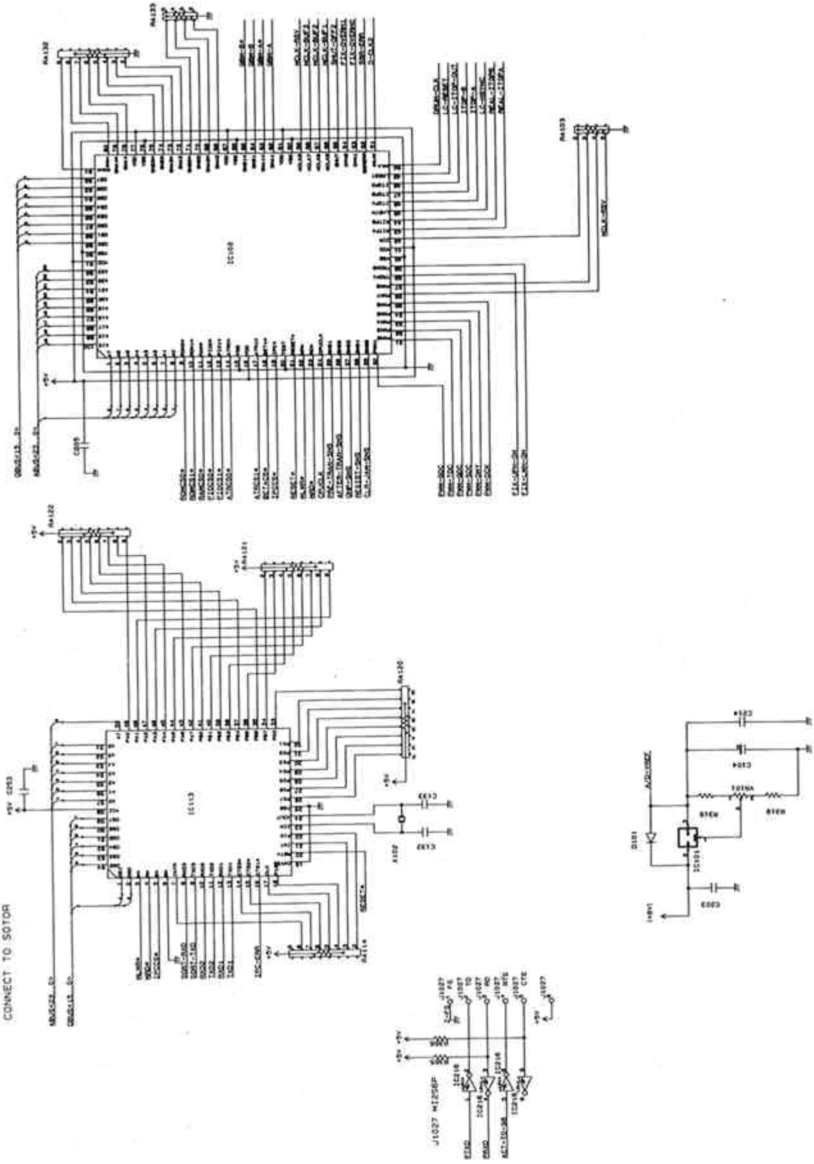
DC controller circuit diagram (CLC700) (2/21)



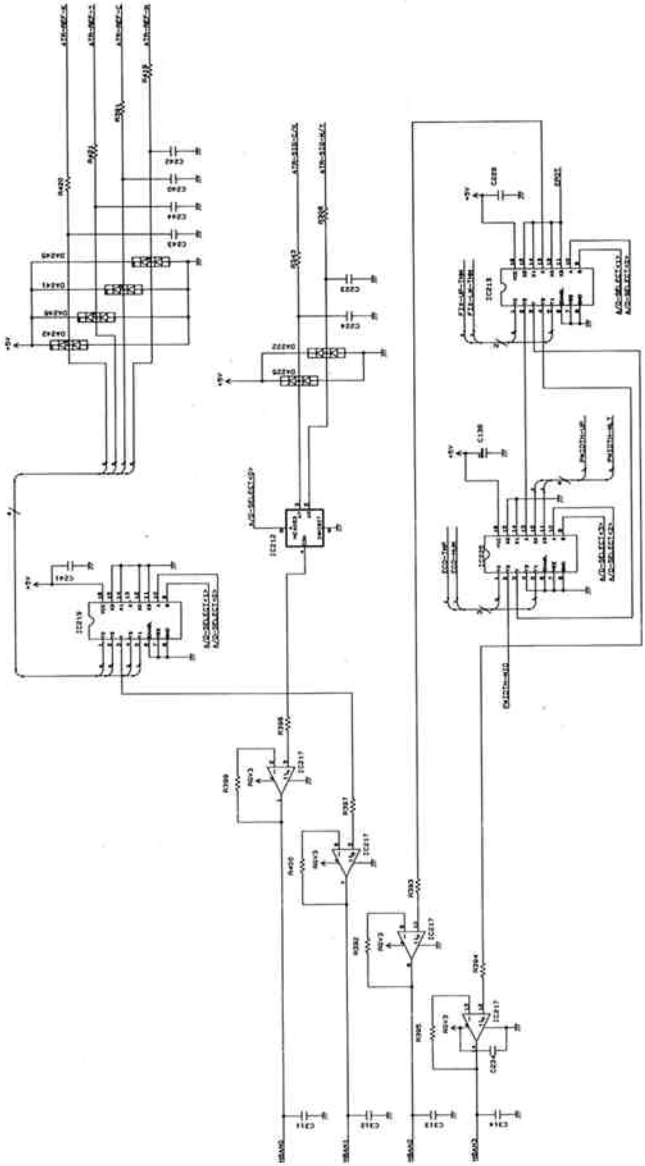
DC controller circuit diagram (CLC700) (3/21)



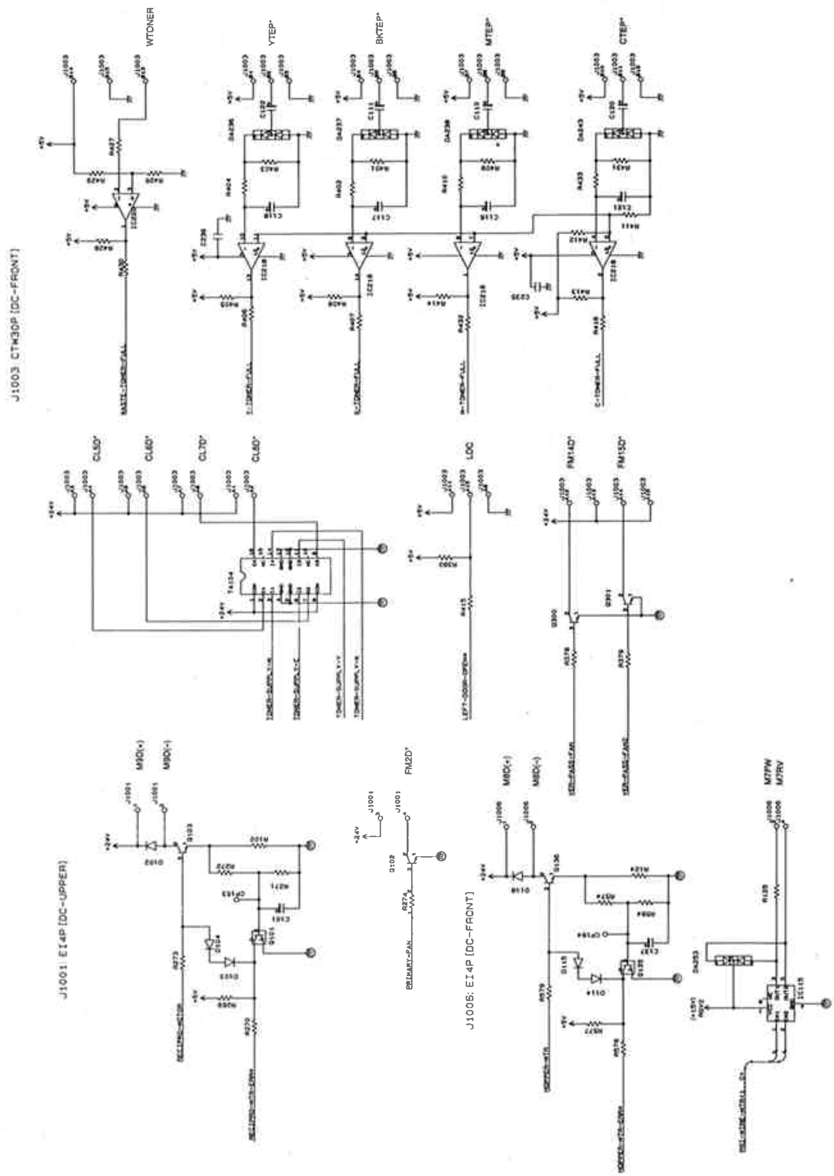
DC controller circuit diagram (CLC700) (4/21)



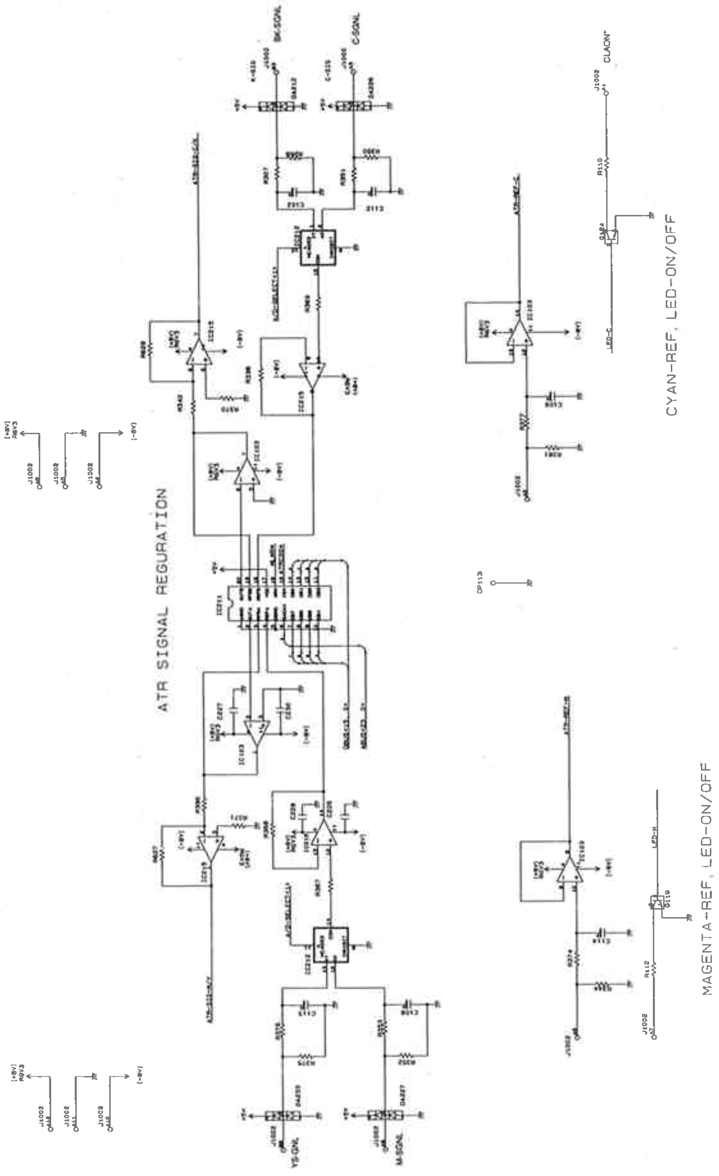
DC controller circuit diagram (CLC700) (5/21)



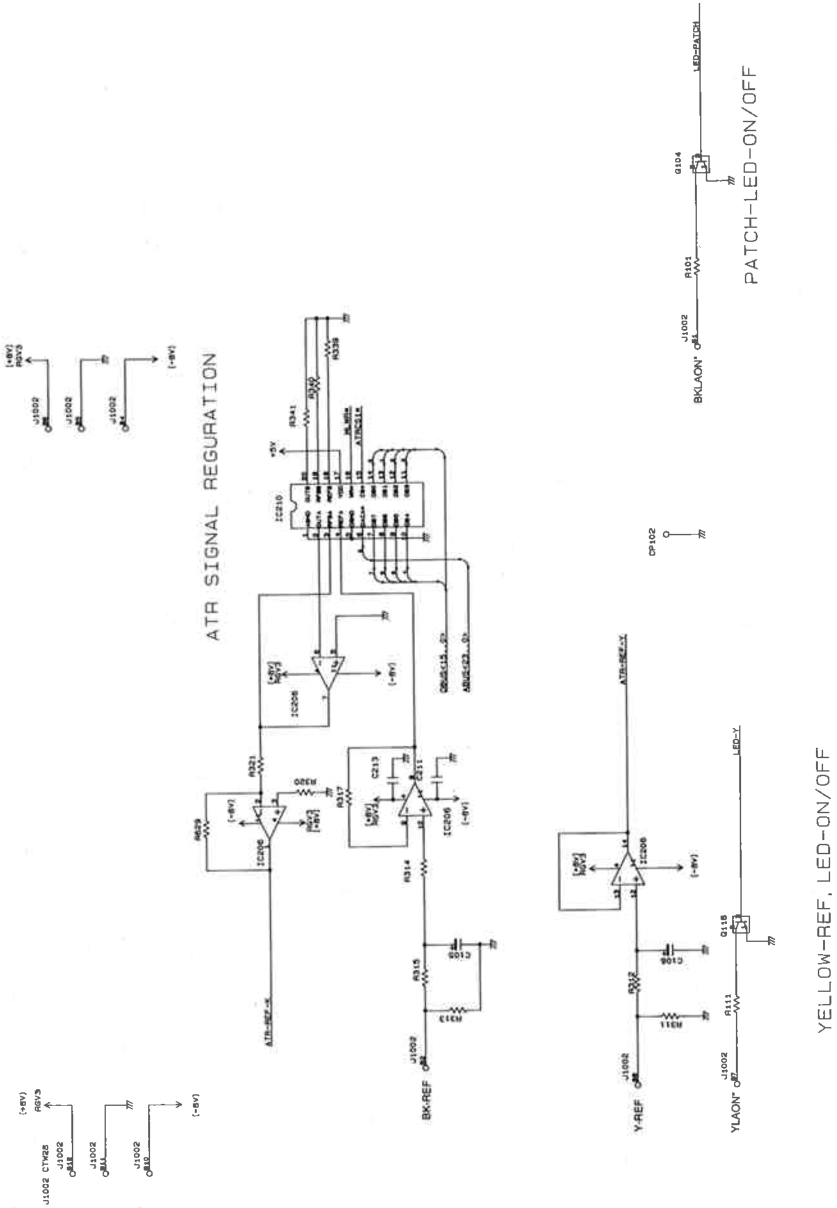
DC controller circuit diagram (CLC700) (6/21)


J1003 CTW30P [DC-FRONT]
WTONER
YTEP*
BKTEP*
MTEP*
CTEP*
CL5D*
CL6D*
CL7D*
CL8D*
LDC
FM14D*
FM15D*
J1001: EI4P [DC-UPPER]
M9D(+)
M9D(-)
FM2D*
J1005: EI4P [DC-FRONT]
M8D(+)
M8D(-)
M7FW
M7RV
+24V
+5V
PRIMARY-FAN

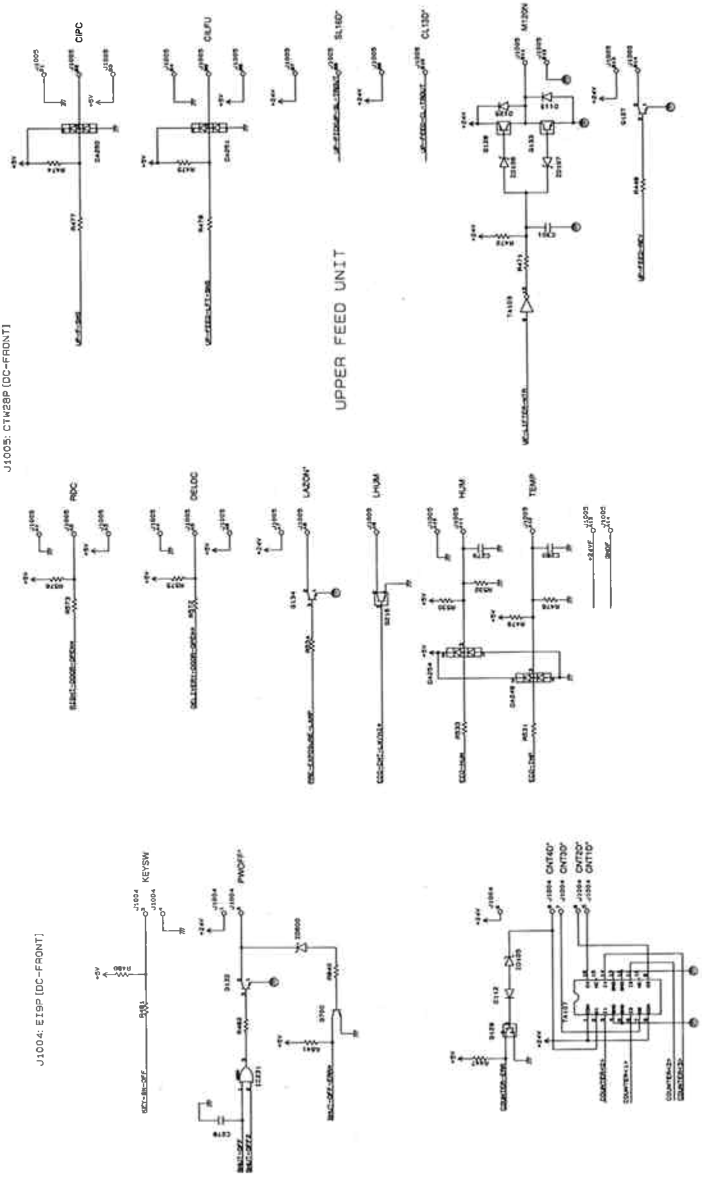
DC controller circuit diagram (CLC700) (7/21)


ATR SIGNAL REGURATION
CYAN-REF, LED-ON/OFF
MAGENTA-REF, LED-ON/OFF
BK-SIGNL
C-SIGNL
YS-GNL
M-SIGNL
CLAON*
J1002
IC201
IC212
IC219
IC215
IC103
IC102
CP113
LED-C
LED-M
R110
R112

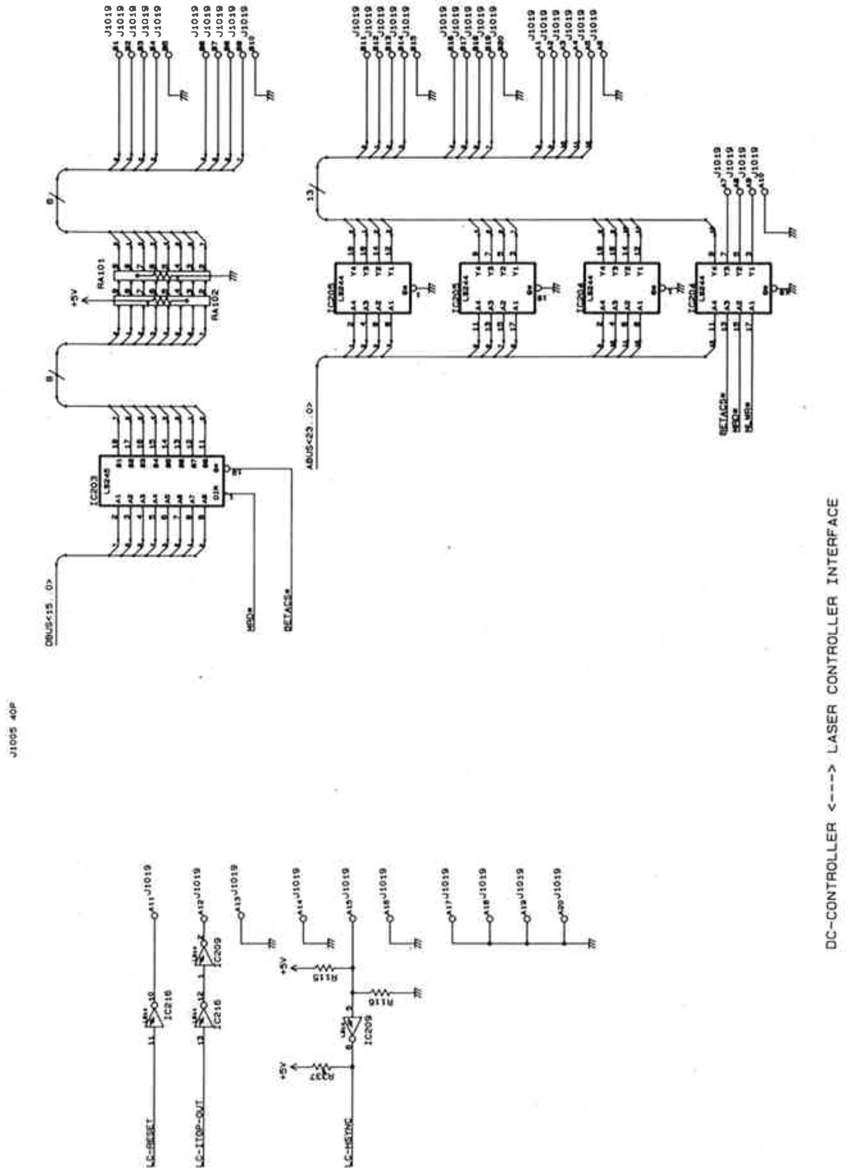
DC controller circuit diagram (CLC700) (8/21)


ATR SIGNAL REGURATION
PATCH-LED-ON/OFF
YELLOW-REF, LED-ON/OFF
LED-PATCH
Q104
R101
J1002
BKLAON*
CP102
ATR-REF-Y
LED-Y
Q118
R111
YLAON*
Y-REF
BK-REF
ATR-REF-K
IC210
IC206
IC208
R321
R320
R317
R314
R315
R313
R629
R341
R340
R339
C213
C211
C105
C106
R312
R311
+5V
[+8V]
RGV3
[-8V]
DBUS<15..0>
ABUS<23..0>
J1002 CTK25

DC controller circuit diagram (CLC700) (9/21)

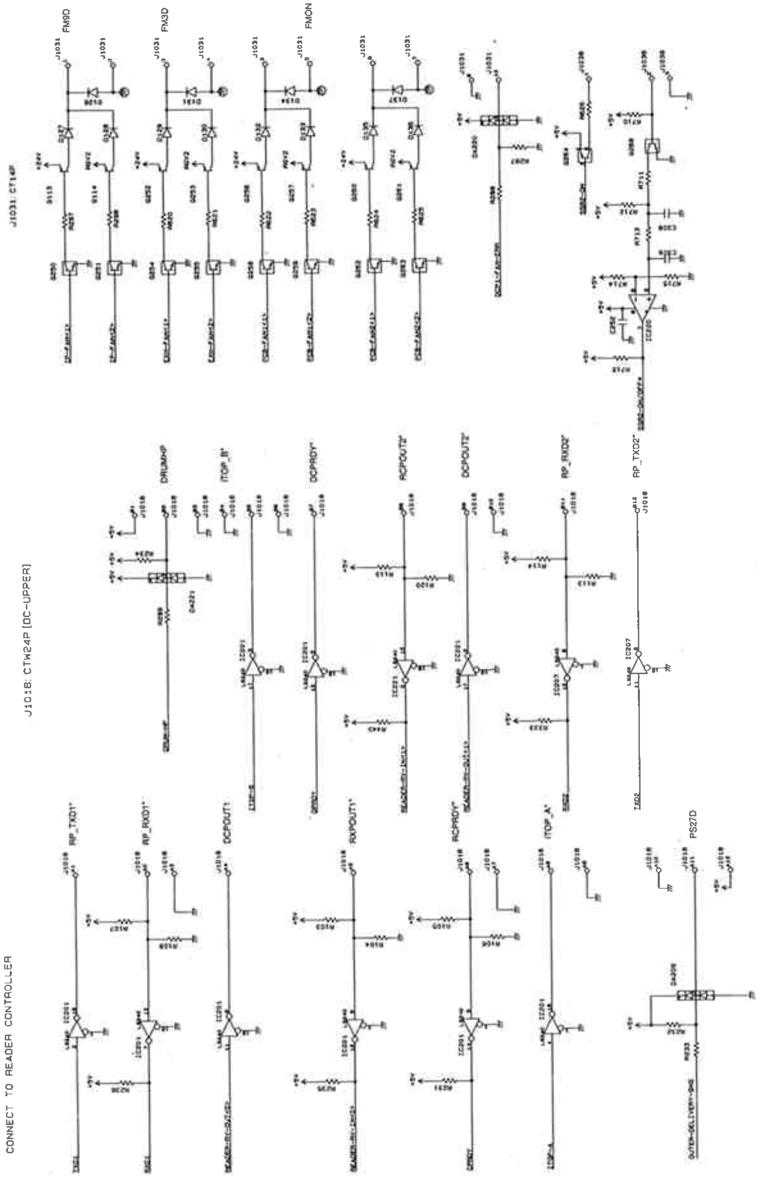

J1005: CTW28P [DC-FRONT]
CIPC
CILFU
SL15D*
CL13D*
M120N
UPPER FEED UNIT
RDC
DELDC
LAZON*
LHUM
HUM
TEMP
J1004: EI9P [DC-FRONT]
KEYSW
PWOFF*
CNT40*
CNT30*
CNT20*
CNT10*

DC controller circuit diagram (CLC700) (10/21)

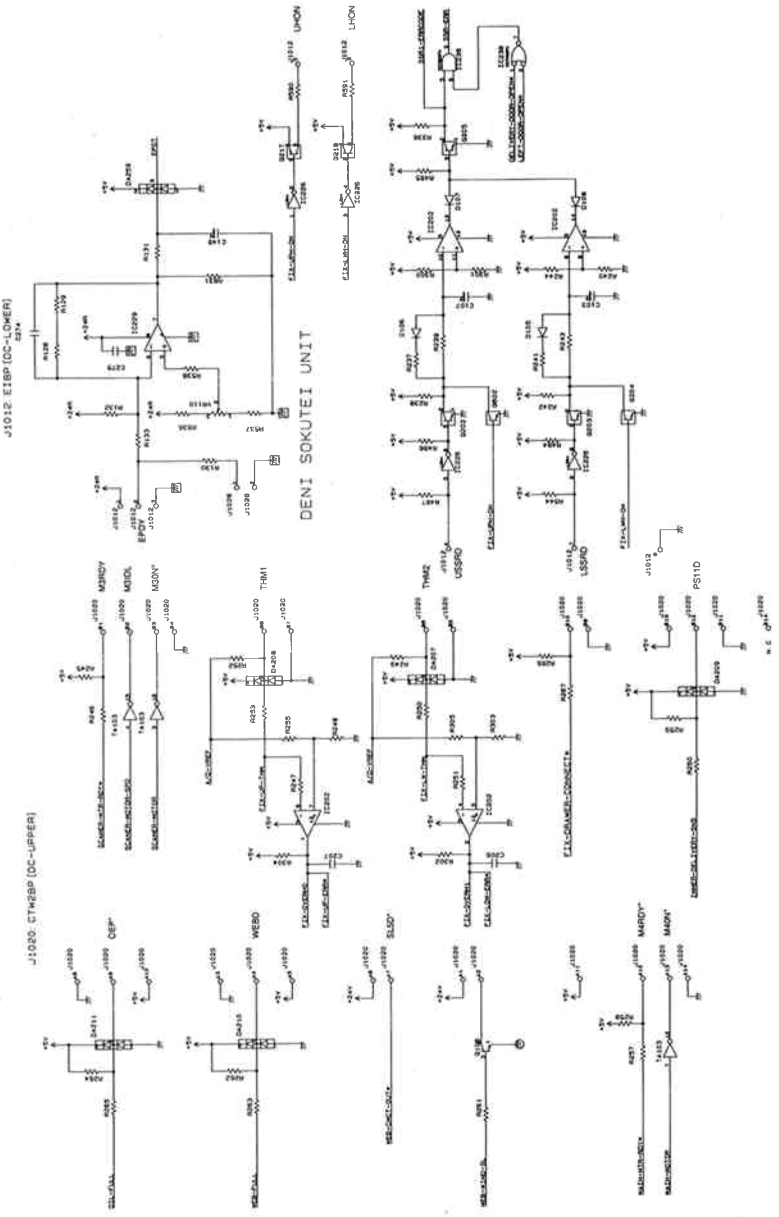

J1005 40P
DBUS<15..0>
ABUS<23..0>
IC203
LS245
RA101
RA102
+5V
LS244
J1019
BETACS*
MSD*
LC-RESET
LC-ITOP-OUT
LC-HSYNC
IC216
IC209
R115
R116
R337

DC-CONTROLLER <---> LASER CONTROLLER INTERFACE

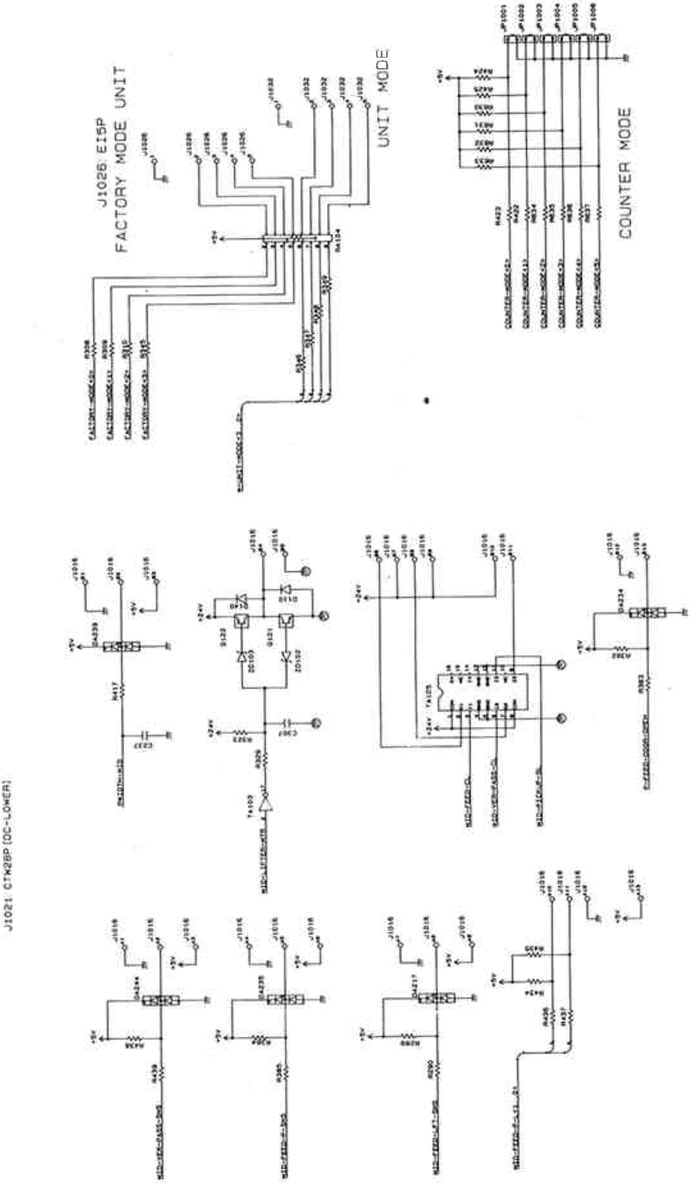
DC controller circuit diagram (CLC700) (11/21)


J1031: CT14P
FM9D
FM3D
FMON
J101B: CTW24P [DC-UPPER]
DRUMHP
ITOP_B*
DCPRDY*
RCPOUT2*
DCPOUT2*
RP_RXD2*
RP_TXD2*
CONNECT TO READER CONTROLLER
RP_TXD1*
RP_RXD1*
DCPOUT1
RXPOUT1*
RCPRDY*
ITOP_A*
PS27D

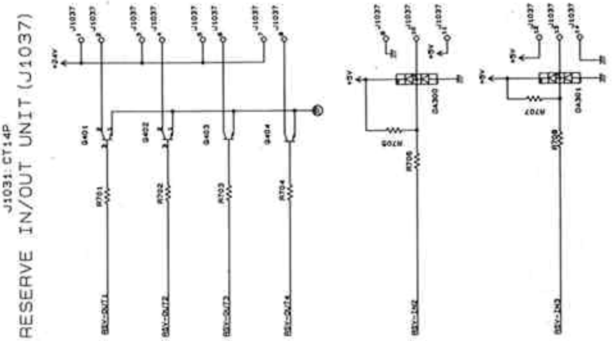
DC controller circuit diagram (CLC700) (12/21)

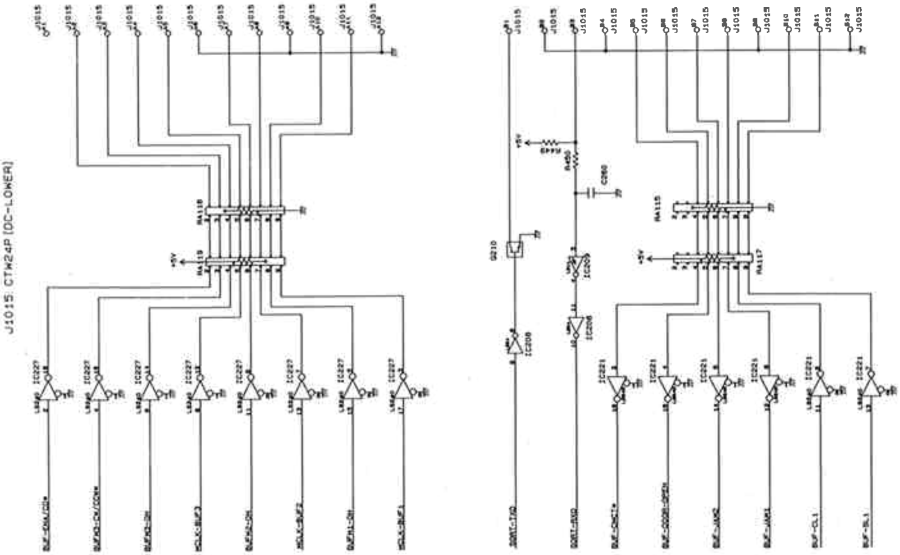

J1012: EIBP [DC-LOWER]
J1020: CTW2BP [DC-UPPER]
DENI SOKUTEI UNIT
UHON
LHON
EPOV
USSRD
LSSRD
PS11D
THM1
THM2
M3RDY
M3IDL
M3ON*
OEP*
WEBO
SL5D*
M4RDY*
M4ON*

DC controller circuit diagram (CLC700) (13/21)

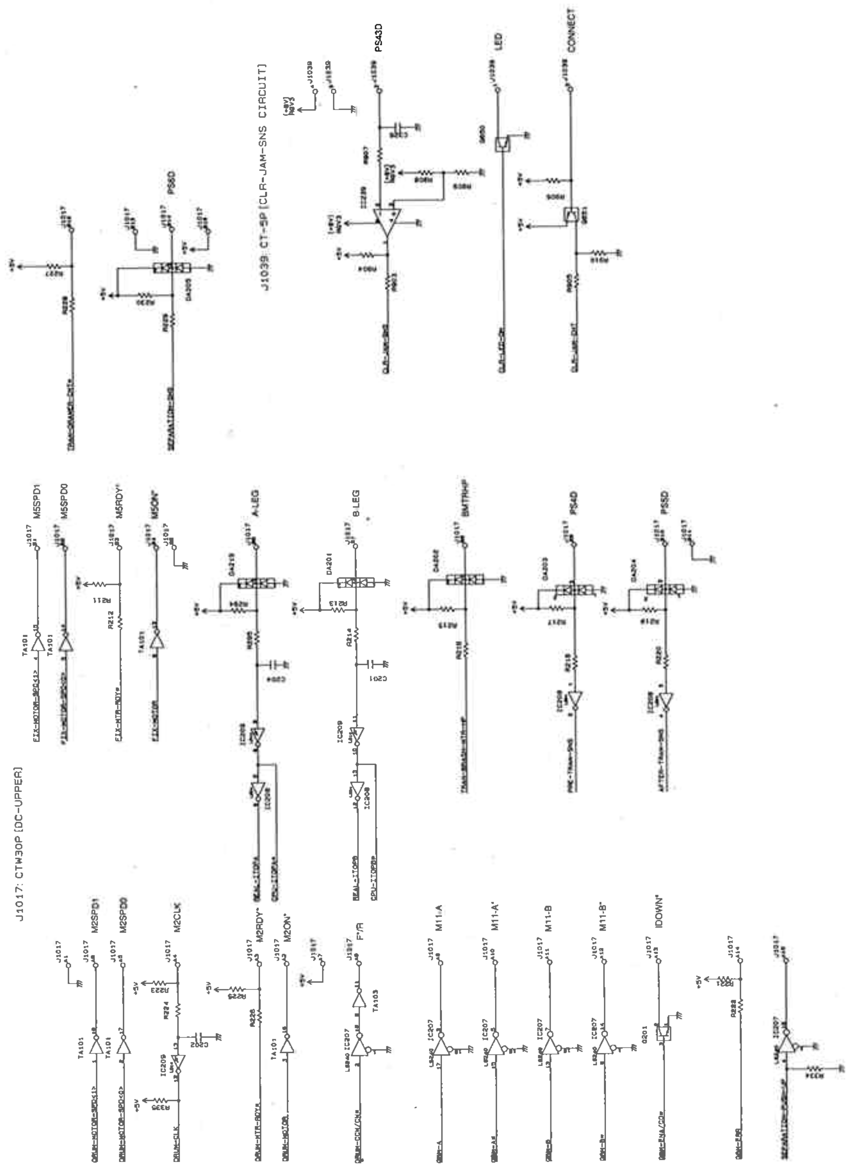

J1026 EI5P
FACTORY MODE UNIT
UNIT MODE
COUNTER MODE
J1021 CTW28P [DC-LOWER]

DC controller circuit diagram (CLC700) (14/21)

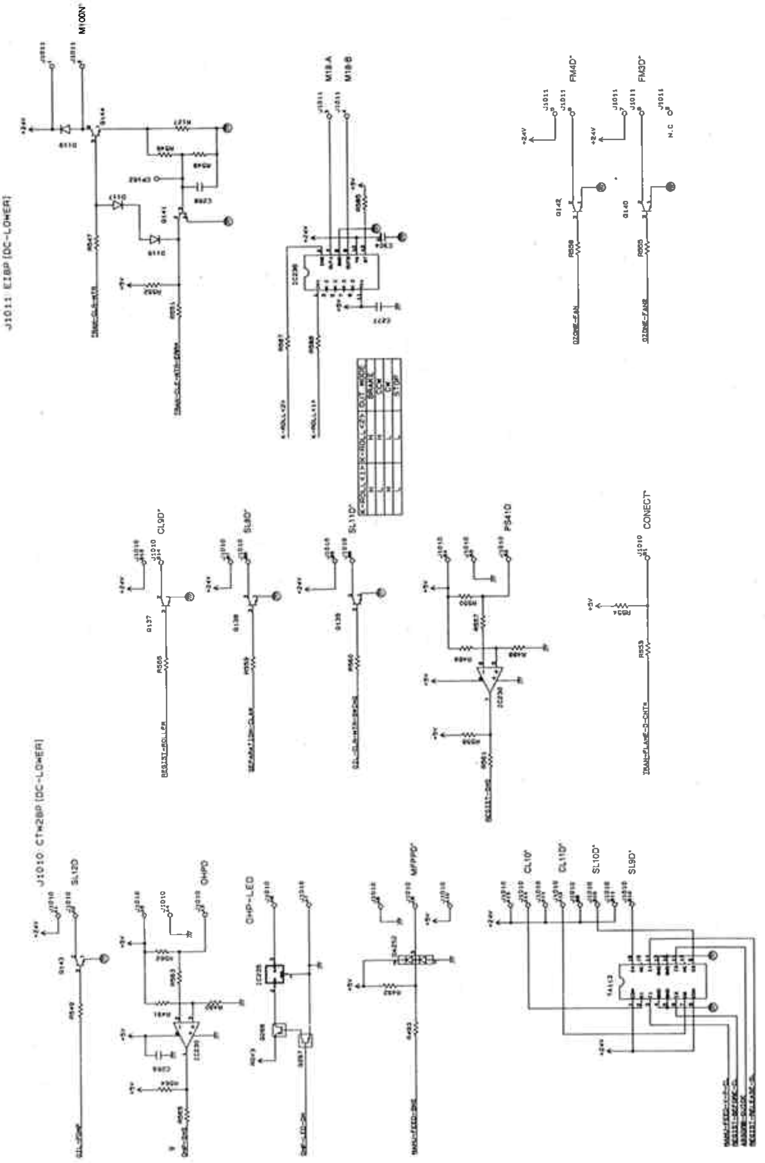

RESERVE IN/OUT UNIT (J1037)
J1031: CT14P
+24V
J1037
Q401
Q402
Q403
Q404
R701
R702
R703
R704
RSV-OUT1
RSV-OUT2
RSV-OUT3
RSV-OUT4
+5V
DA300
DA301
R705
R706
R707
R708
RSV-IN2
RSV-IN3


J1015: CTW24P (DC-LOWER)
J1015
RA118
RA119
RA115
RA117
+5V
IC227
IC221
IC208
IC209
Q210
R449
R450
C260
SORT-TXD
SORT-RXD
BUF-JAM2
BUF-JAM1
BUF-CL1
BUF-SL1

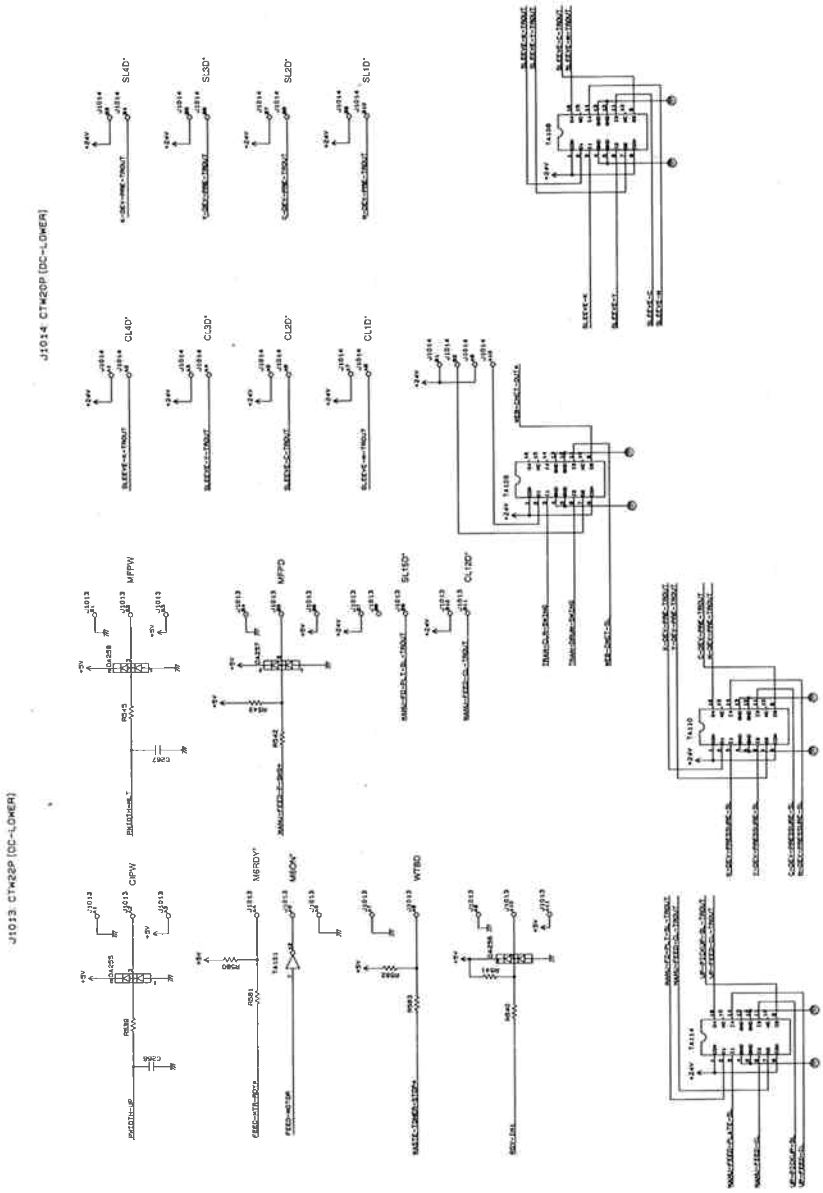
DC controller circuit diagram (CLC700) (15/21)


J1039: CT-5P [CLR-JAM-SNS CIRCUIT]
PS43D
LED
CONNECT
PS5D
J1017: CTW30P [DC-UPPER]
M5SPD1
M5SPD0
M5RDY*
M5ON*
A-LEG
B-LEG
BMTRHP
PS4D
PS5D
M2SPD1
M2SPD0
M2CLK
M2RDY*
M2ON*
F*/R
M11-A
M11-A*
M11-B
M11-B*
IDOWN*

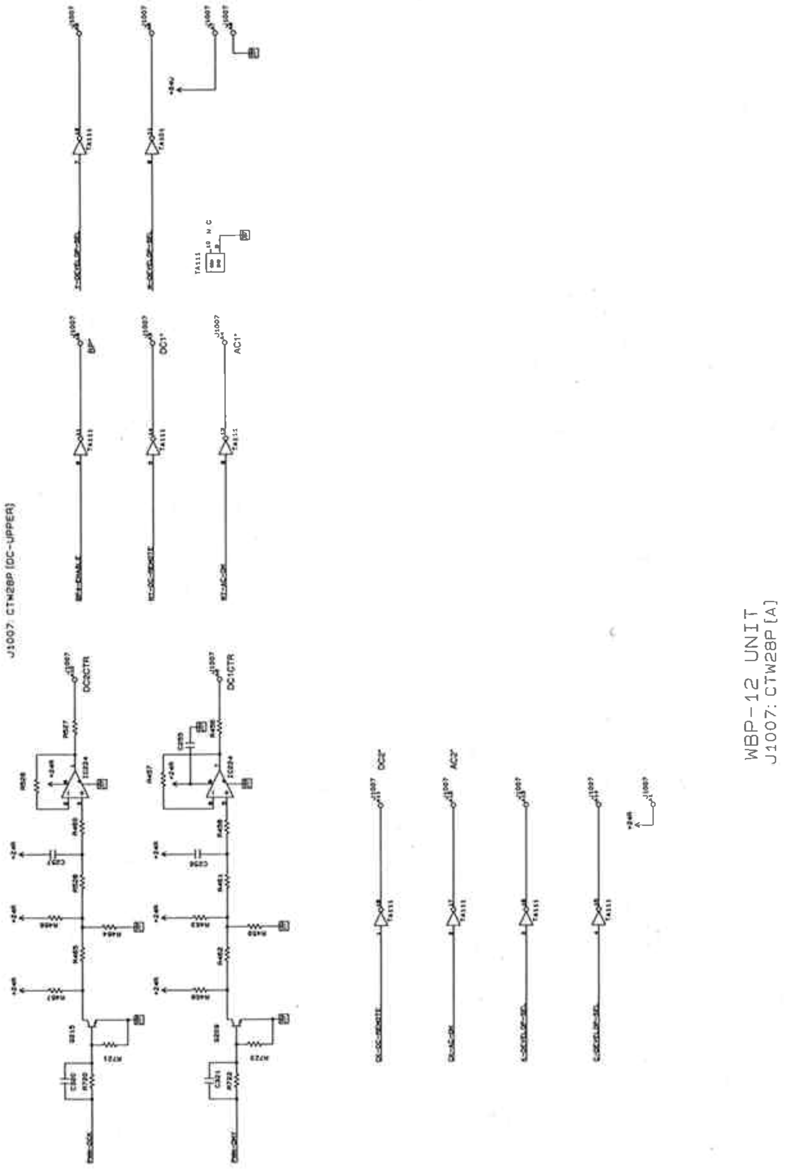
DC controller circuit diagram (CLC700) (16/21)


J1011 E18P (DC-LOWER)
M100N*
M18-A
M18-B
FM4D*
FM3D*
N.C
Q144
Q141
Q142
Q140
IC236
CL9D*
SL8D*
SL11D*
PS41D
CONECT*
Q137
Q138
Q139
OUT MODE
BRAKE
CCW
CW
STOP
J1010 CTW28P (DC-LOWER)
SL12D
OHPD
OHP-LED
MFPPD*
CL10*
CL11D*
SL10D*
SL9D*
Q143
+24V
+5V

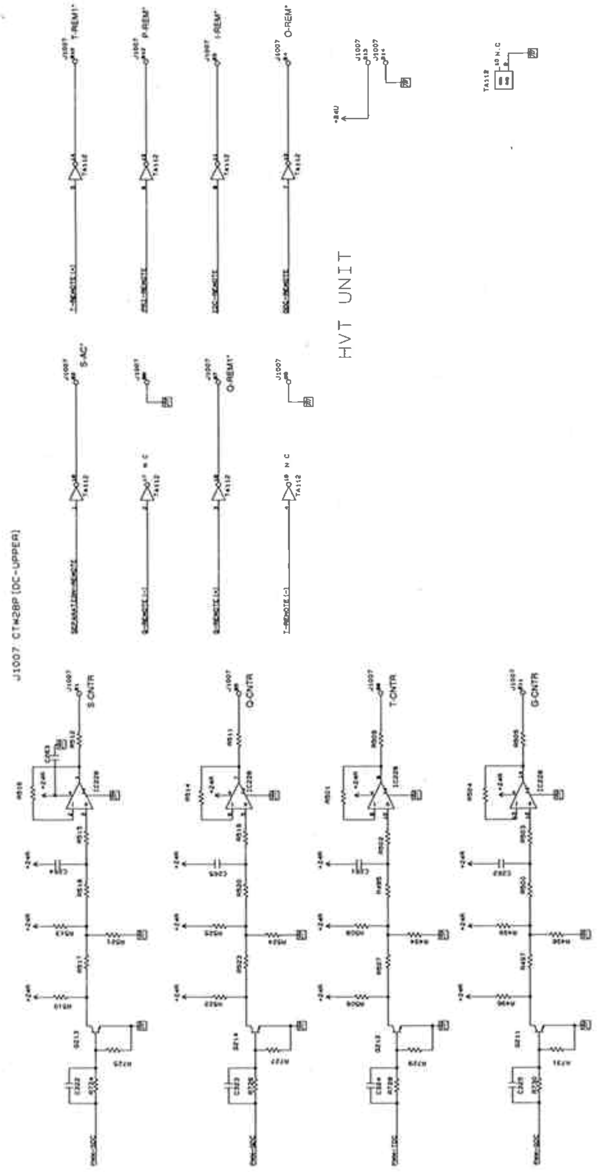
DC controller circuit diagram (CLC700) (17/21)


J1014 CTW20P (DC-LOWER)
J1013 CTW22P (DC-LOWER)
SL4D*
SL3D*
SL2D*
SL1D*
CL4D*
CL3D*
CL2D*
CL1D*
MFPW
MFPD
SL15D*
CL12D*
CIPW
M6RDY*
M6ON*
WTBD
+24V
+5V
DA255
DA256
R545
R539
C267
C268
R542
R580
R581
R583
TA131
TA128
TA129
TA130
TA134

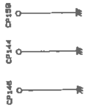
DC controller circuit diagram (CLC700) (18/21)

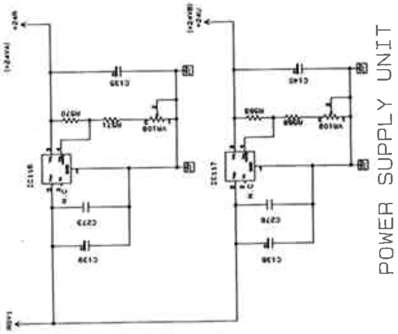

J1007: CTW28P (DC-UPPER)
DC2CTR
DC1CTR
IC224
BP*
DC1*
AC1*
TA111
DC2*
AC2*
WBP-12 UNIT
J1007: CTW28P [A]

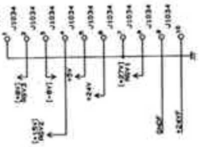
DC controller circuit diagram (CLC700) (19/21)

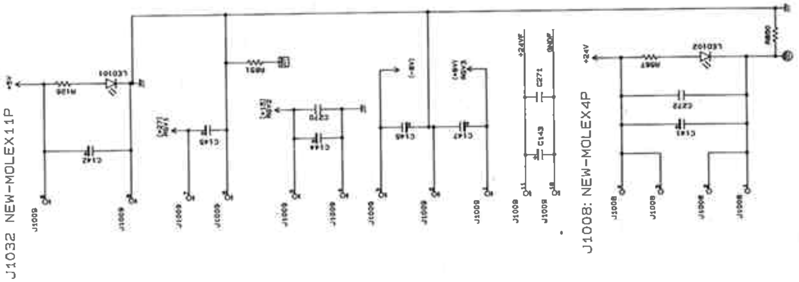

T-REM1*
P-REM*
I-REM*
O-REM*
S-AC*
O-REM1*
HVT UNIT
J1007: CTW28P [DC-UPPER]
S-CNTR
O-CNTR
T-CNTR
G-CNTR
TA112
N.C
+24V

DC controller circuit diagram (CLC700) (20/21)

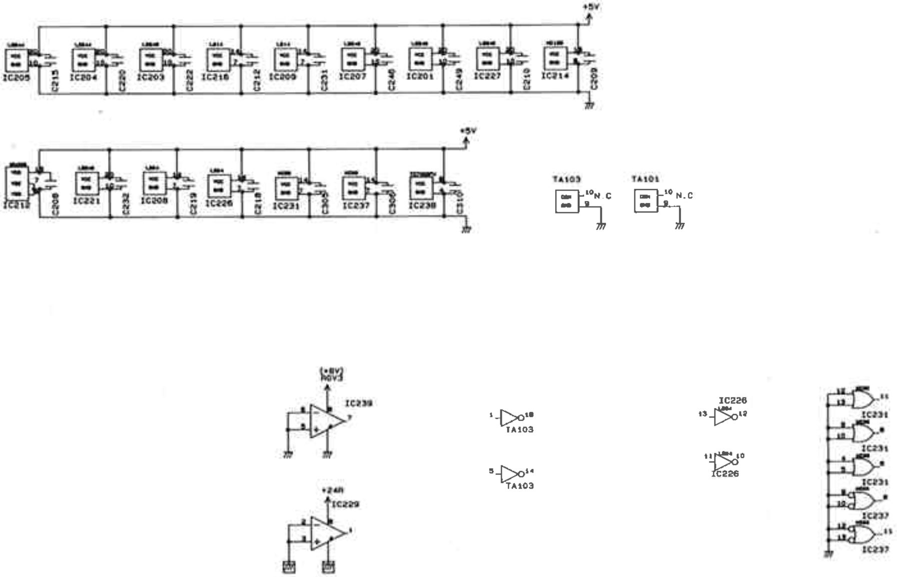

CP150
CP144
CP146


POWER SUPPLY UNIT
IC116
IC117
C135
C140
C273
C276
C138
VR108
(+24VA)
(+24VB)

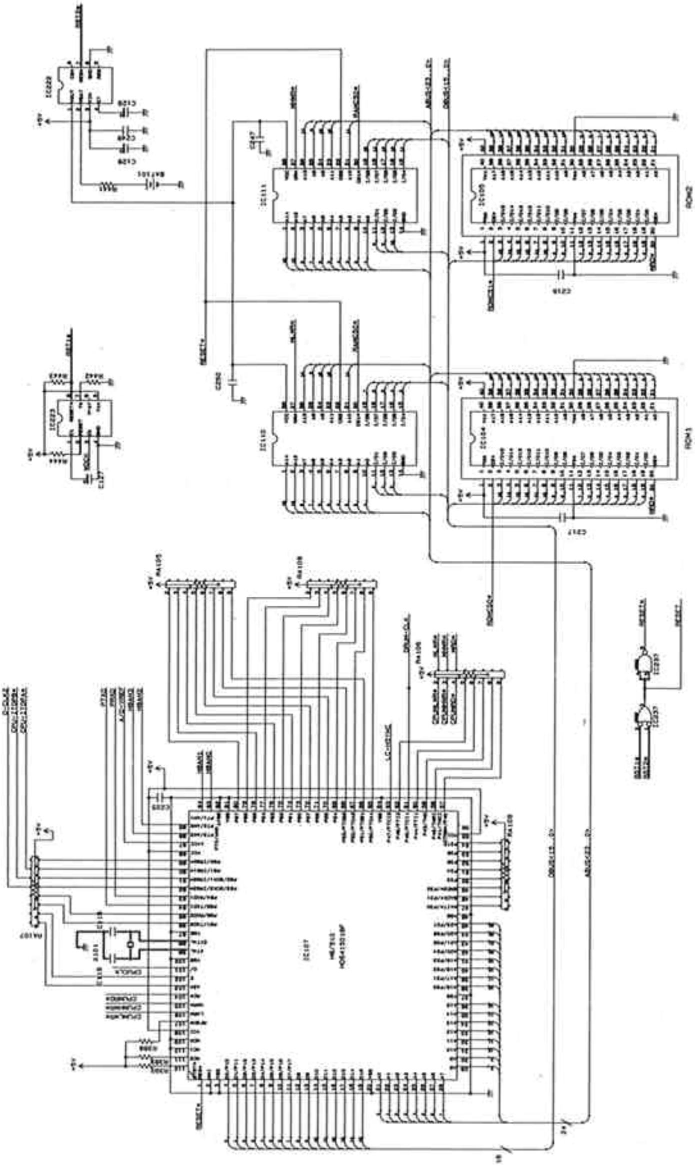

J1034
+24V
+5V
(-8V)


J1032 NEW-MOLEX11P
J1008: NEW-MOLEX4P
J1009
J1008
LED101
LED102
R126
R567
C142
C145
C272
C271
C143
C141
+5V
+24V
+24VE
GNDE
(-8V)

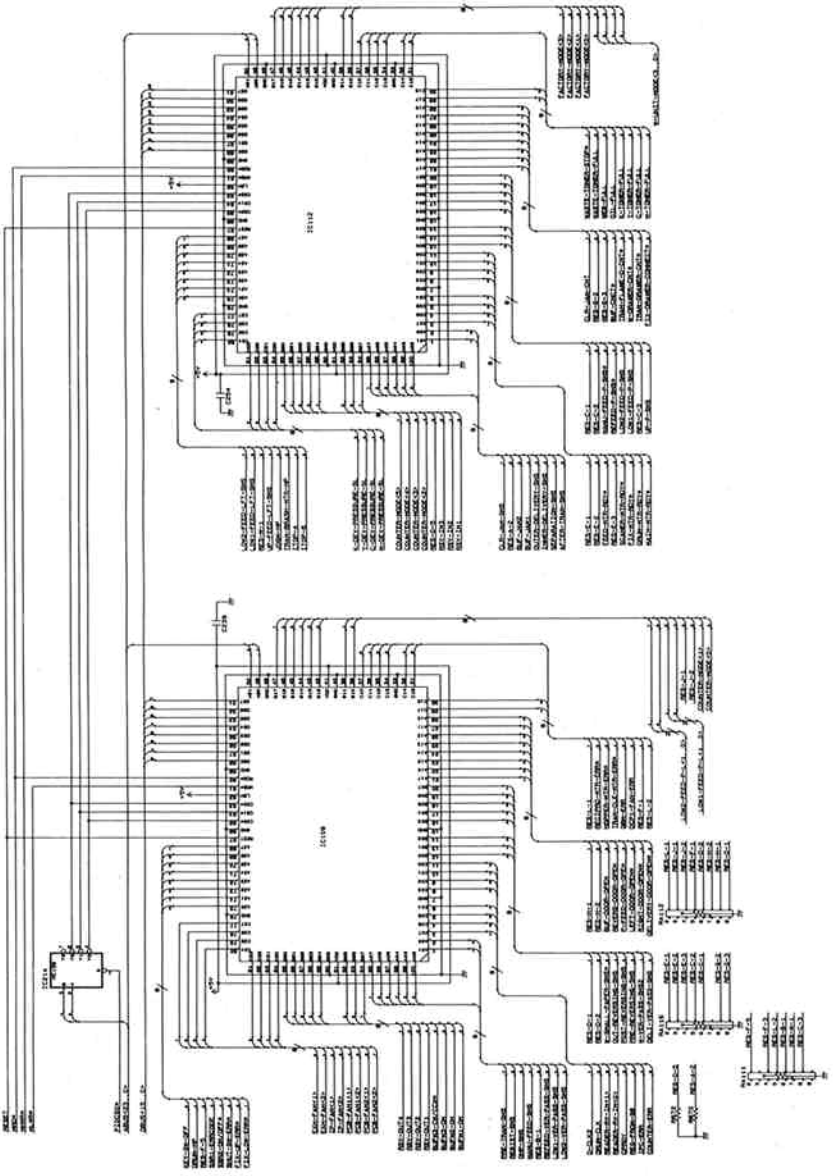
DC controller circuit diagram (CLC700) (21/21)


+5V
IC205
IC204
IC203
IC216
IC209
IC207
IC201
IC227
IC214
C215
C220
C222
C212
C231
C246
C249
C210
C209
+5V
IC212
IC221
IC208
IC226
IC231
IC237
IC238
C208
C232
C219
C218
C305
C306
C310
TA103
TA101
N.C
N.C
(+8V)
RGV3
IC239
+24R
IC229
TA103
TA103
IC226
IC226
IC231
IC231
IC231
IC237
IC237

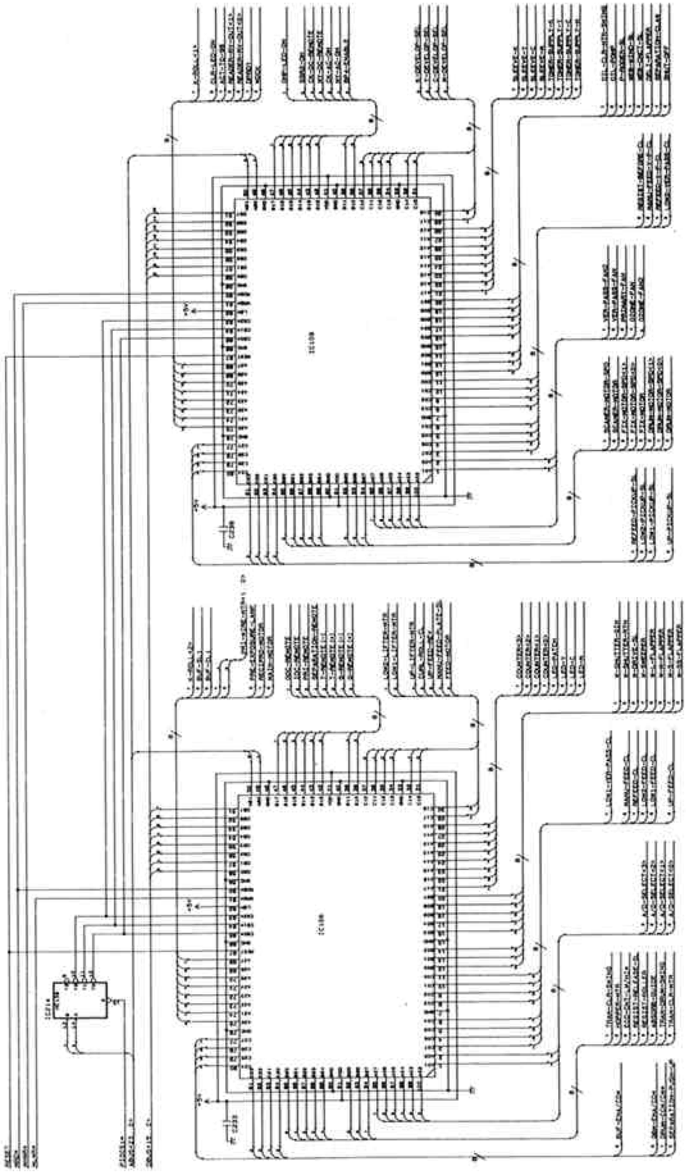
DC controller circuit diagram (CLC800) (1/22)


ROM1
ROM2
IC107
RESET*

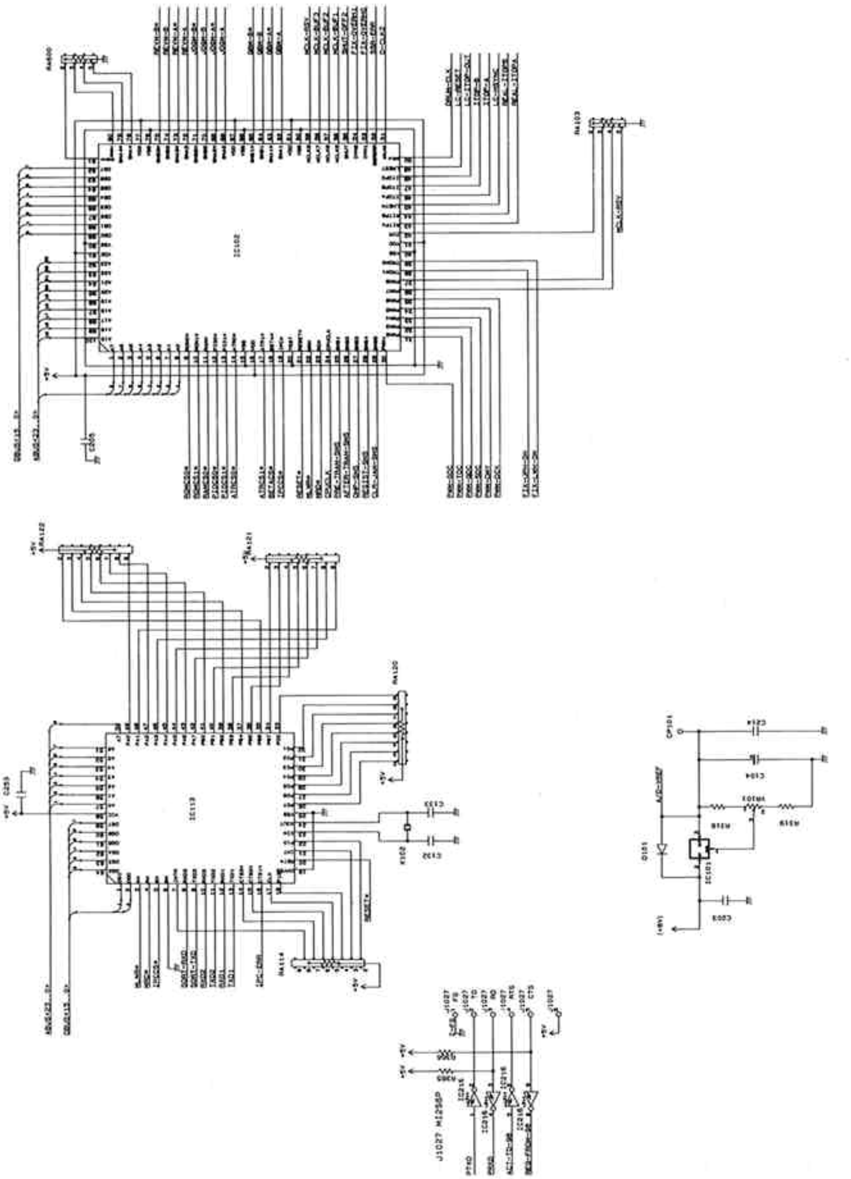
DC controller circuit diagram (CLC800) (2/22)



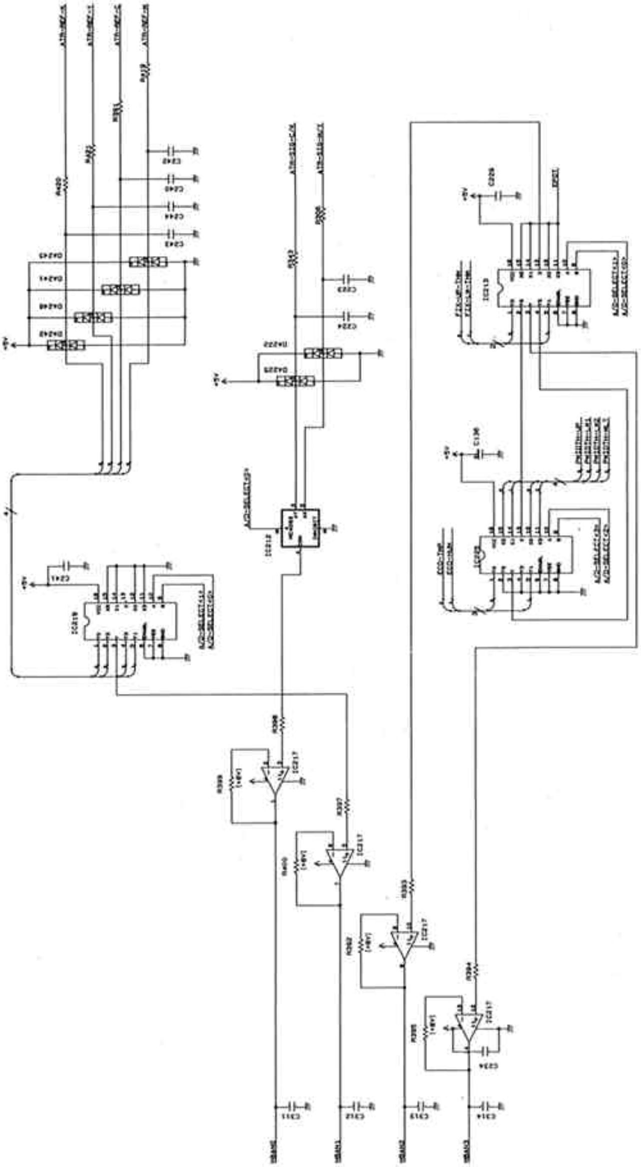
DC controller circuit diagram (CLC800) (3/22)



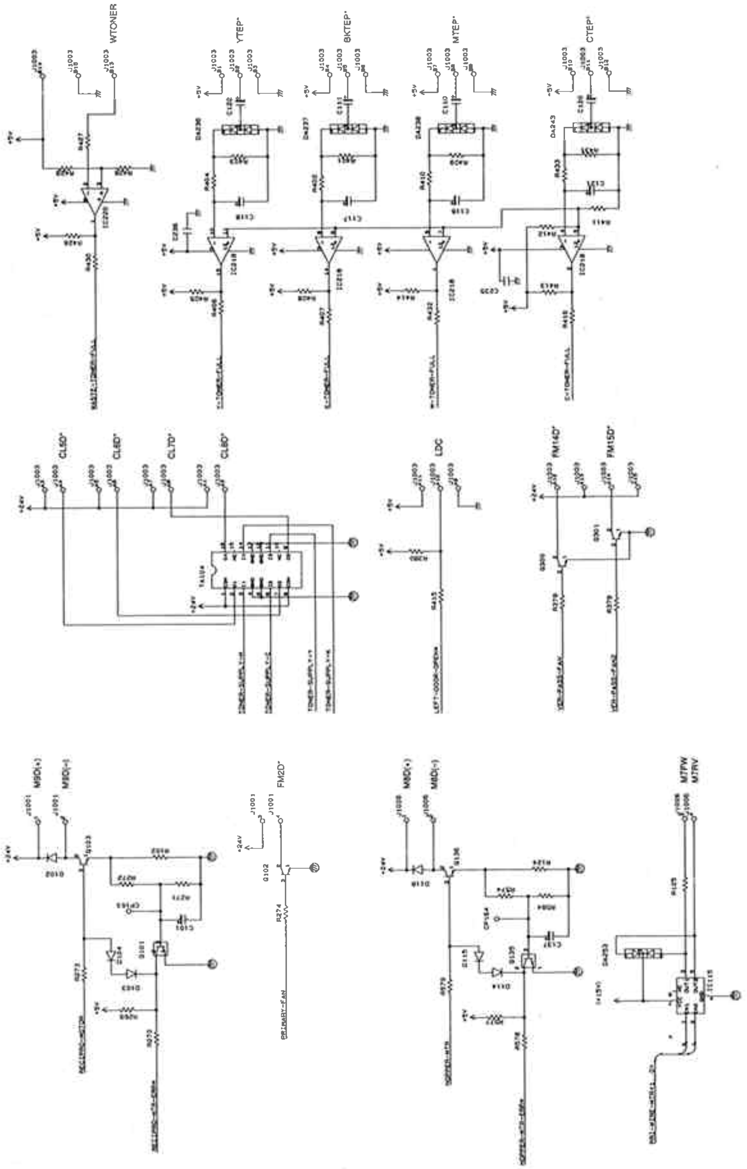
DC controller circuit diagram (CLC800) (4/22)


IC102
IC113
IC101
J1027 MI258P

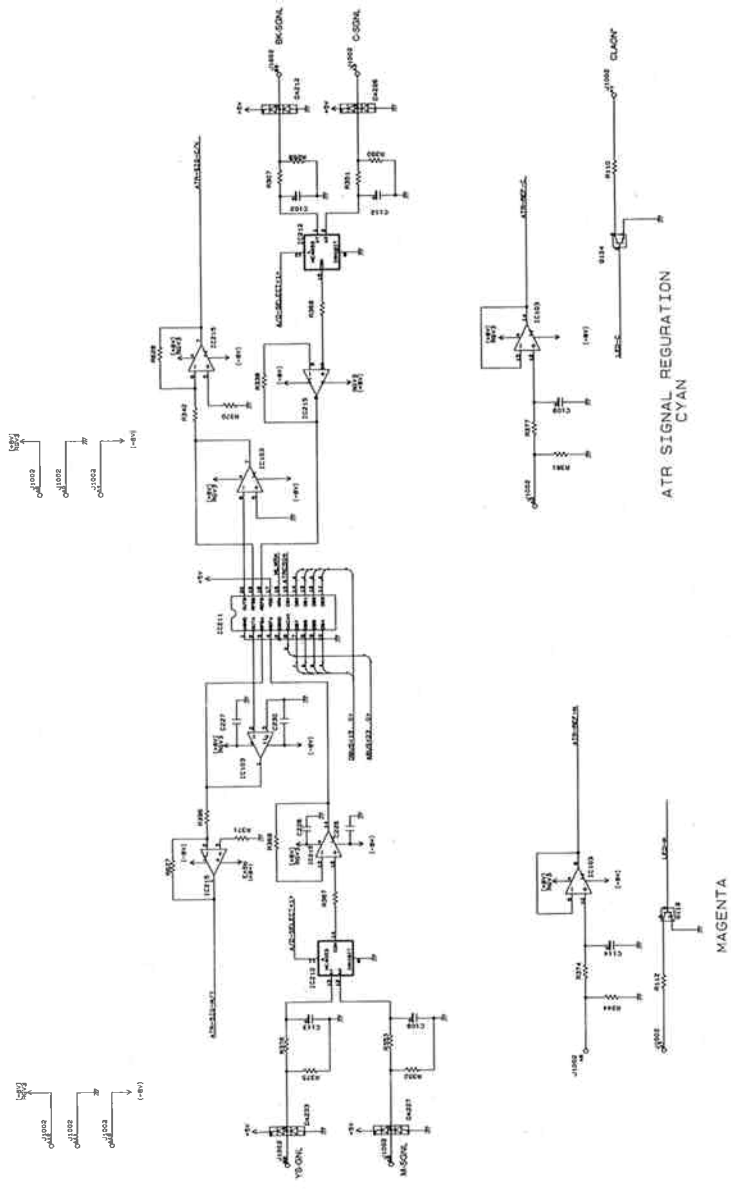
DC controller circuit diagram (CLC800) (5/22)


ATR-REF-K
ATR-REF-Y
ATR-REF-C
ATR-REF-M
R420
R421
R391
R419
DA242
DA248
DA241
DA245
C243
C244
C240
C242
+5V
IC219
C241
A/D-SELECT<1>
A/D-SELECT<0>
IC212
HC4052
A/D-SELECT<2>
DA225
DA222
R343
R306
ATR-SIG-C/K
ATR-SIG-M/Y
C224
C223
R399
R400
R392
R395
(+8V)
R398
R397
R393
R394
IC217
C234
HSAN0
HSAN1
HSAN2
HSAN3
C311
C312
C313
C314
ECO-THM
ECO-HUM
IC220
C136
PWIDTH-UP
PWIDTH-LK1
PWIDTH-LK2
PWIDTH-MLT
A/D-SELECT<3>
FIX-UP-THM
FIX-LW-THM
IC213
C229
EPOT

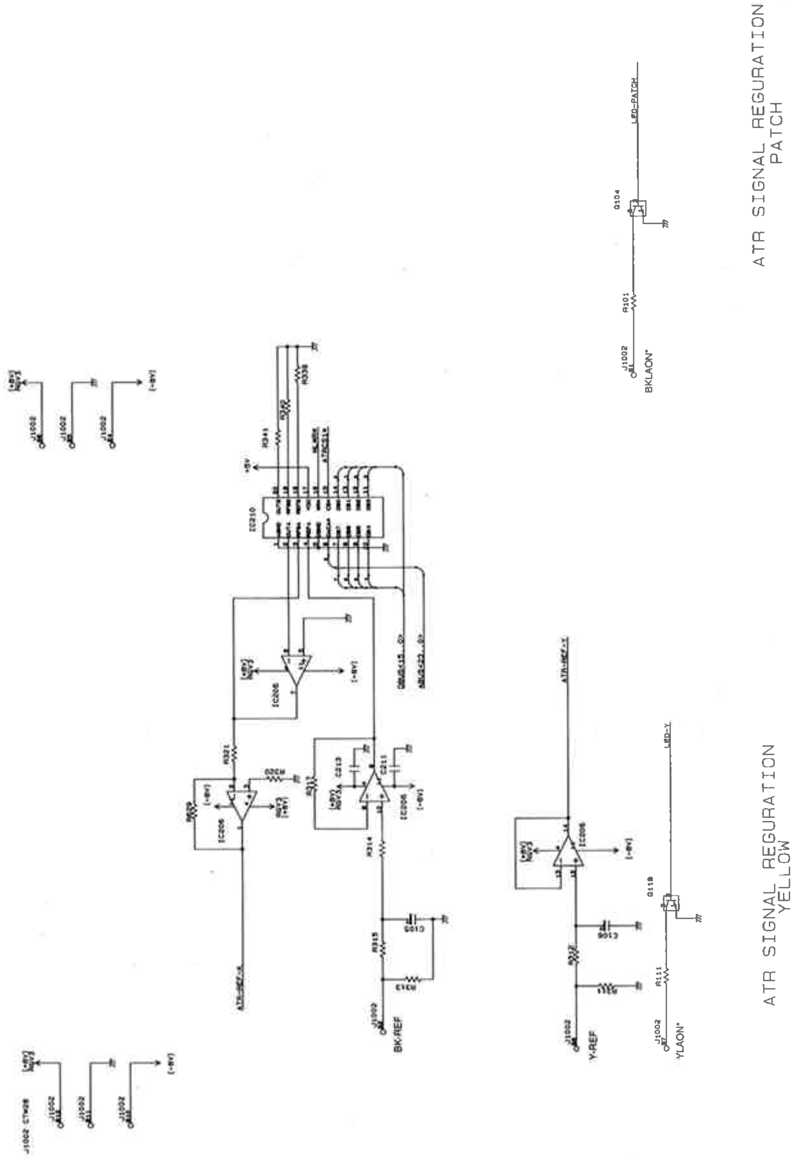
DC controller circuit diagram (CLC800) (6/22)


WTONER
YTEP*
BKTEP*
MTEP*
CTEP*
J1003
+5V
+24V
IC218
IC220
TA1104
CL5D*
CL6D*
CL7D*
CL8D*
LDC
FM14D*
FM15D*
M9D(+)
M9D(-)
FM2D*
M8D(+)
M8D(-)
MTFW
MTRV
J1001
Q102
R274
PRIMARY-FAN
IC115

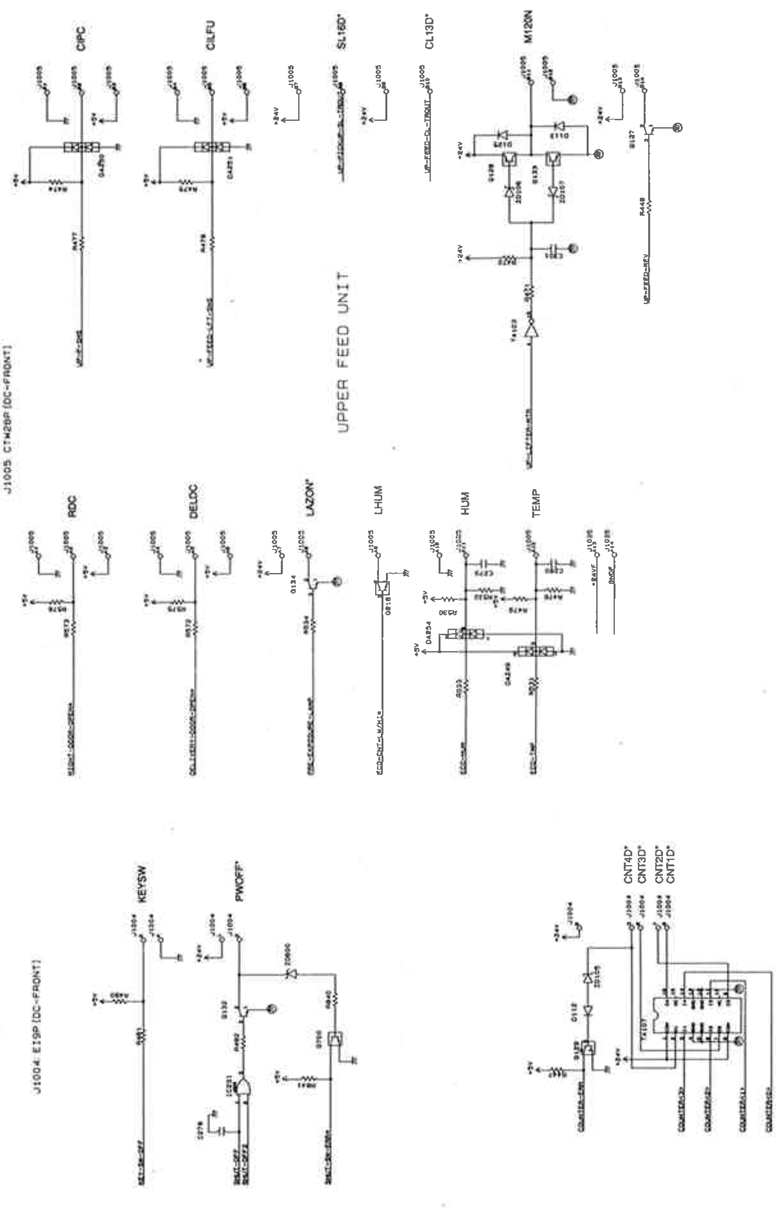
DC controller circuit diagram (CLC800) (7/22)


BK-SGNL
C-SGNL
M-SGNL
J1002
IC211
ATR SIGNAL REGURATION
CYAN
MAGENTA

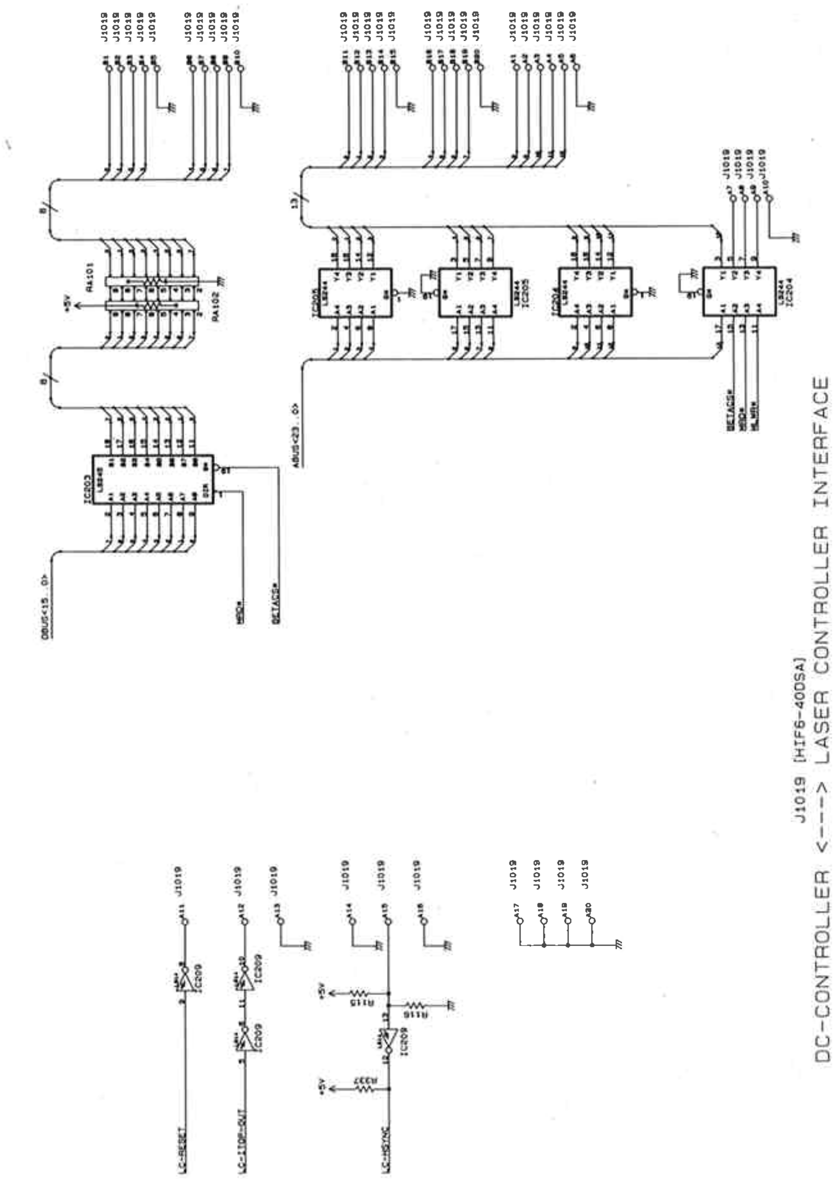
DC controller circuit diagram (CLC800) (8/22)


ATR SIGNAL REGURATION
PATCH
ATR SIGNAL REGURATION
YELLOW
LED-PATCH
Q104
R101
J1002
BKLAON*
R338
R341
IC210
+5V
IC206
(+8V)
(-8V)
R321
R314
R315
C213
C211
ATR-REF-Y
BK-REF
Y-REF
LED-Y
Q118
R111
YLAON*
J1002 CTW28

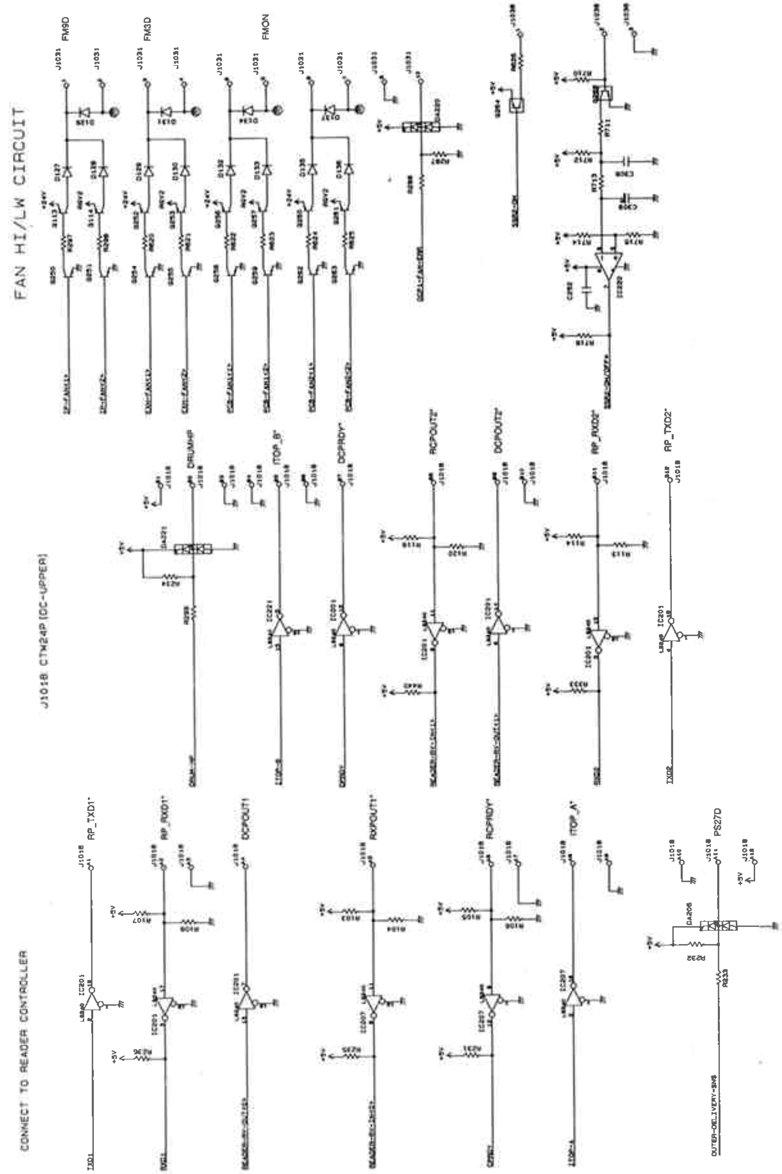
DC controller circuit diagram (CLC800) (9/22)


J1005 CTM26P (DC-FRONT)
CIPC
CILFU
SL16D*
CL13D*
M120N
UPPER FEED UNIT
RDC
DELDC
LAZON*
LHUM
HUM
TEMP
J1004 EISP (DC-FRONT)
KEYSW
PWOFF*
CNT4D*
CNT3D*
CNT2D*
CNT1D*

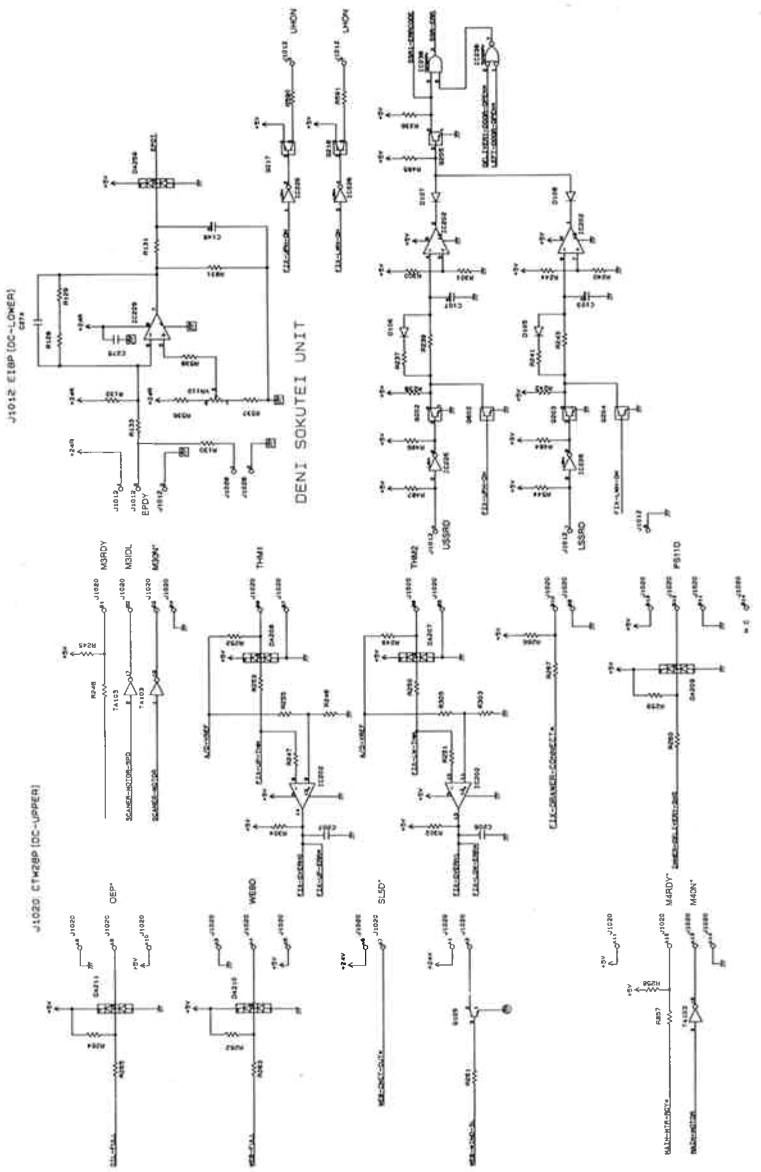
DC controller circuit diagram (CLC800) (10/22)


DBUS<15..0>
IC203
LS245
MSD*
DETACS*
RA101
RA102
+5V
ABUS<23..0>
IC205
IC204
LS244
J1019
DETACS*
MSD*
HLWR*
LC-RESET
LC-ITOP-OUT
LC-HSYNC
IC209
R115
R116
R337
J1019 (HIF6-40DSA)
DC-CONTROLLER <---> LASER CONTROLLER INTERFACE

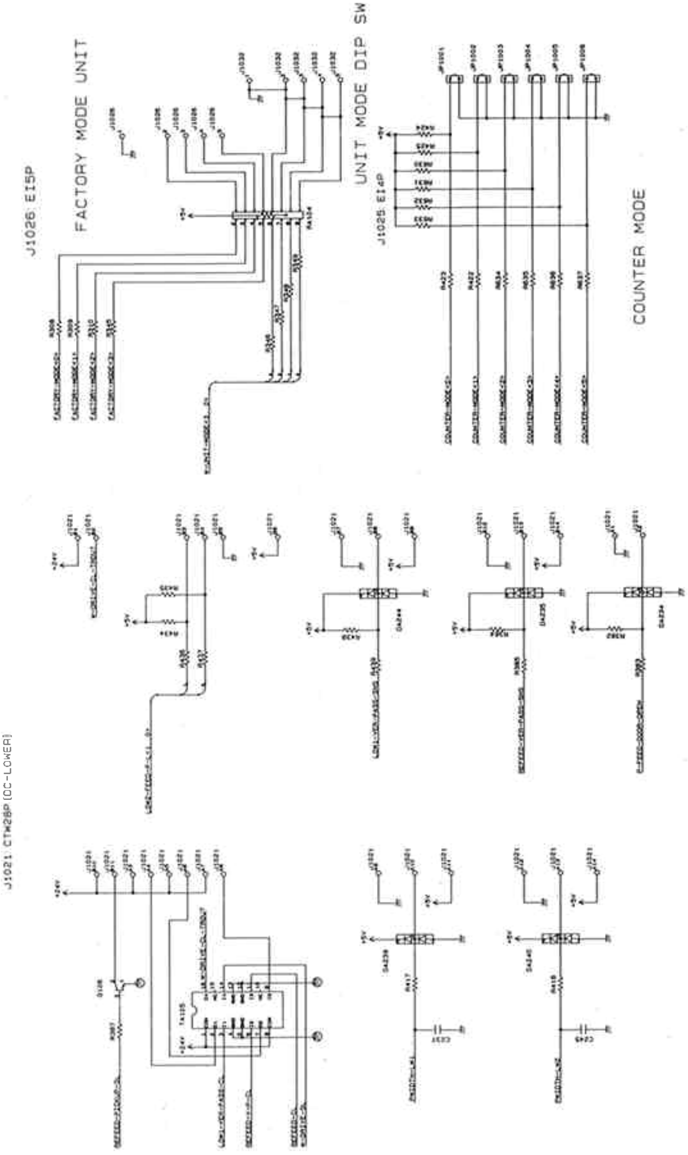
DC controller circuit diagram (CLC800) (11/22)


FAN HI/LW CIRCUIT
J1018 CTW24P (DC-UPPER)
CONNECT TO READER CONTROLLER
FM9D
FM3D
FMON
DRUMHP
ITOP_B*
DCPRDY*
RCPOUT2*
DCPOUT2*
RP_RXD2*
RP_TXD2*
RP_TXD1*
RP_RXD1*
DCPOUT1*
RXPOUT1*
RCPRDY*
ITOP_A*
PS27D

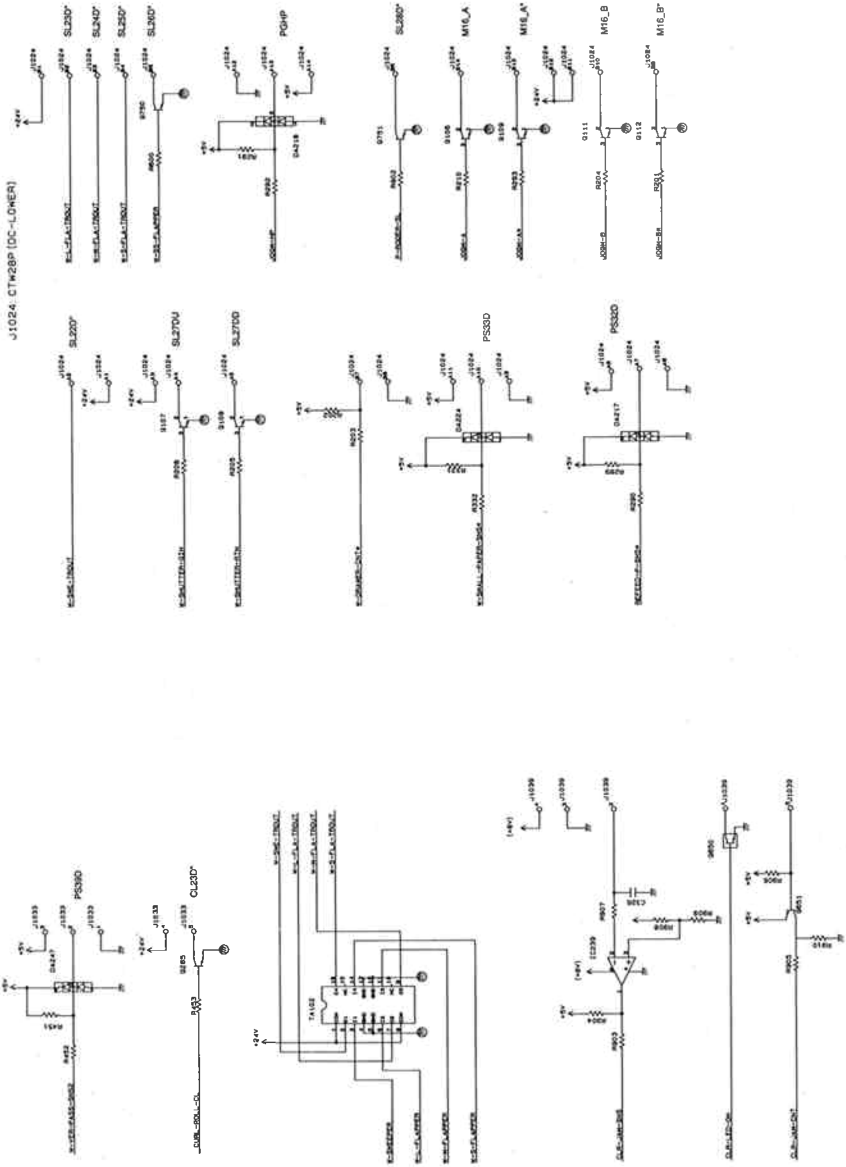
DC controller circuit diagram (CLC800) (12/22)


J1012 EIBP (DC-LOWER)
J1020 CTW28P (DC-UPPER)
DENI SOKUTEI UNIT
UHON
LHON
EPDY
M3RDY
M3IDL
M3ON*
THM1
THM2
USSRD
LSSRD
PS11D
OEP*
WEBO
SL5D*
M4RDY*
M4ON*

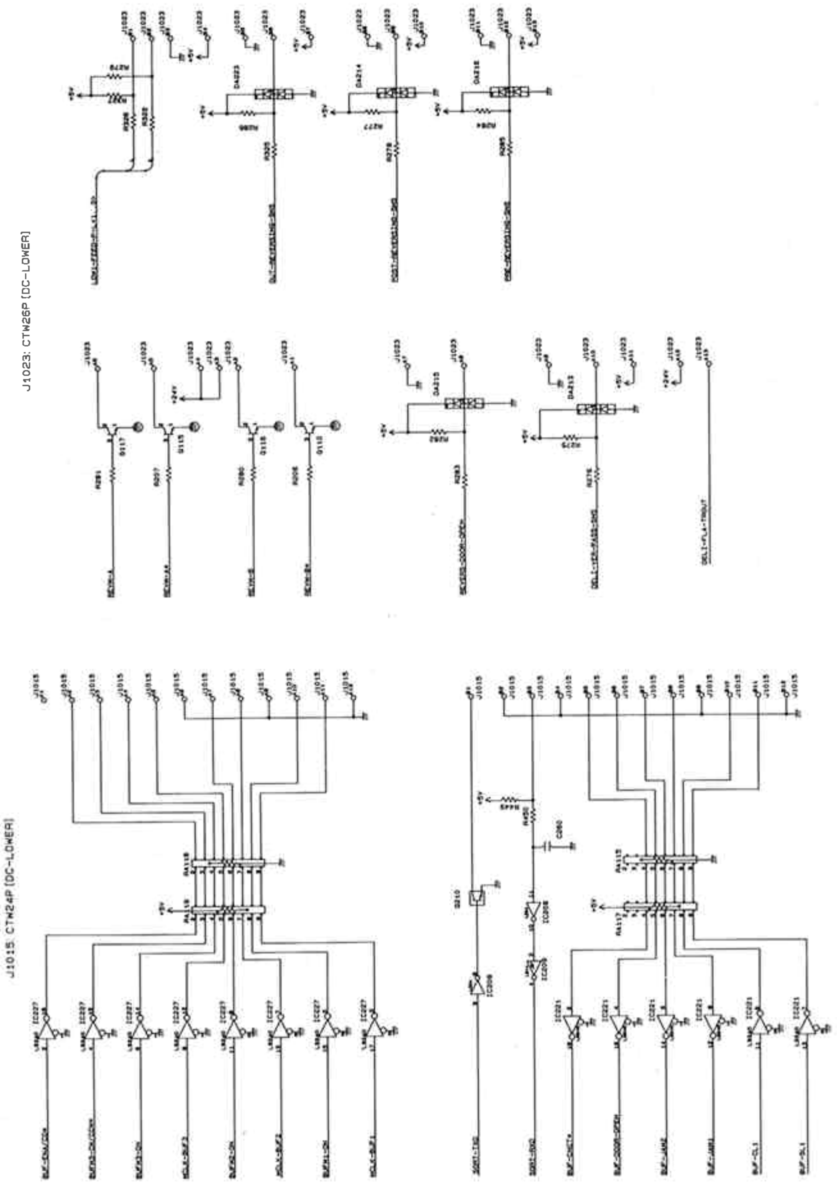
DC controller circuit diagram (CLC800) (13/22)


J1026 EI5P
FACTORY MODE UNIT
UNIT MODE DIP SW
J1025 EI4P
COUNTER MODE
J1021 CTW28P (DC-LOWER)

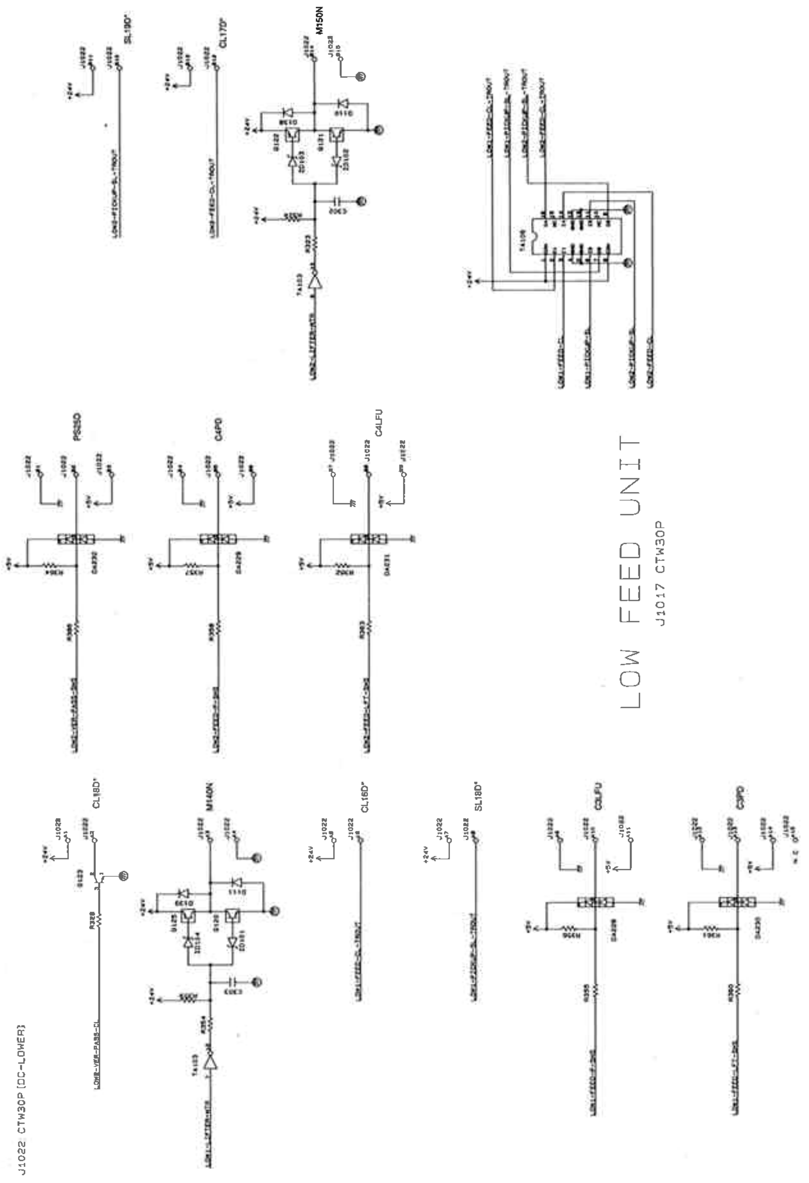
DC controller circuit diagram (CLC800) (14/22)


J1024: CTW28P (DC-LOWER)
SL23D*
SL24D*
SL25D*
SL36D*
PGHP
SL38D*
M16_A
M16_A*
M16_B
M16_B*
SL22D*
SL27DU
SL27DD
PS33D
PS32D
PS39D
CL23D*
TA102
+24V
+5V

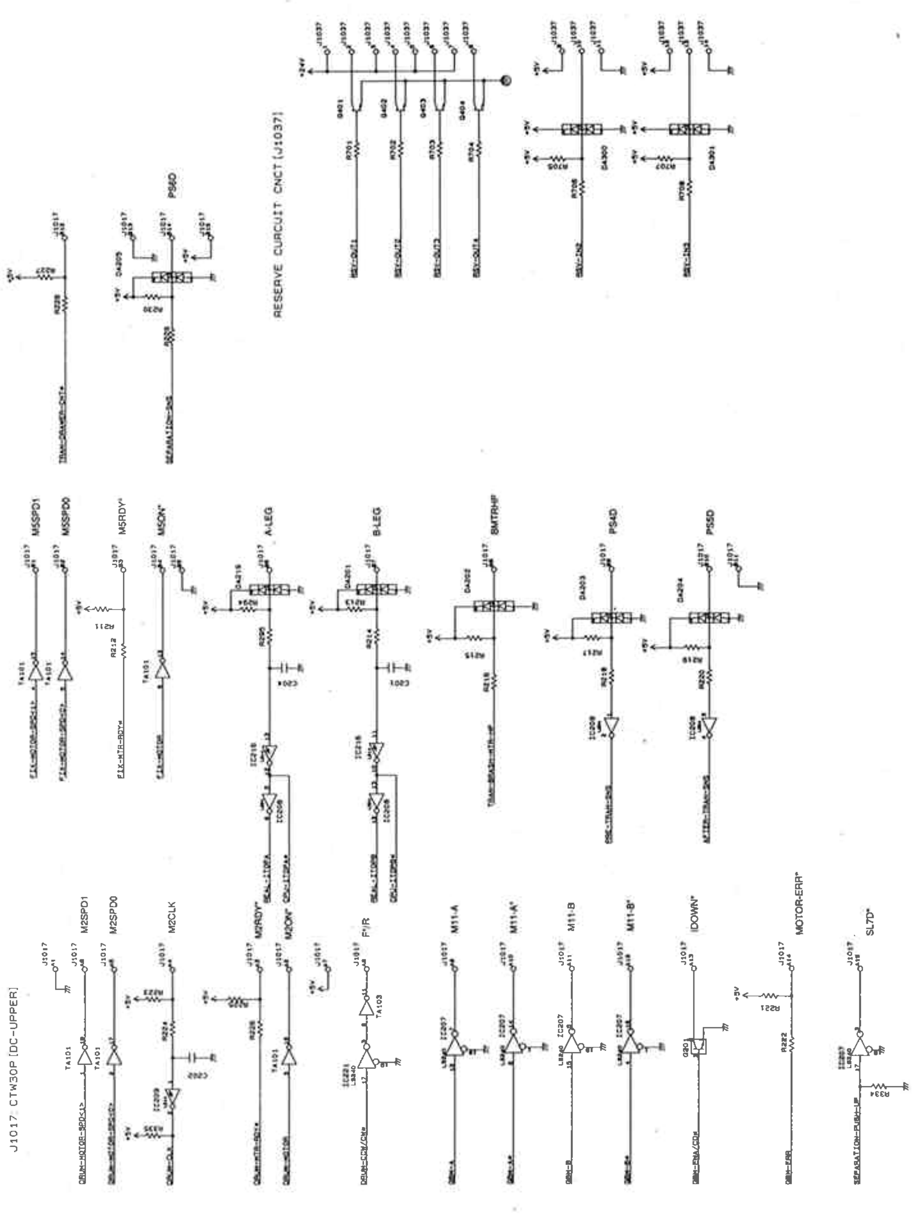
DC controller circuit diagram (CLC800) (15/22)


J1023: CTW26P [DC-LOWER]
J1015: CTW24P [DC-LOWER]

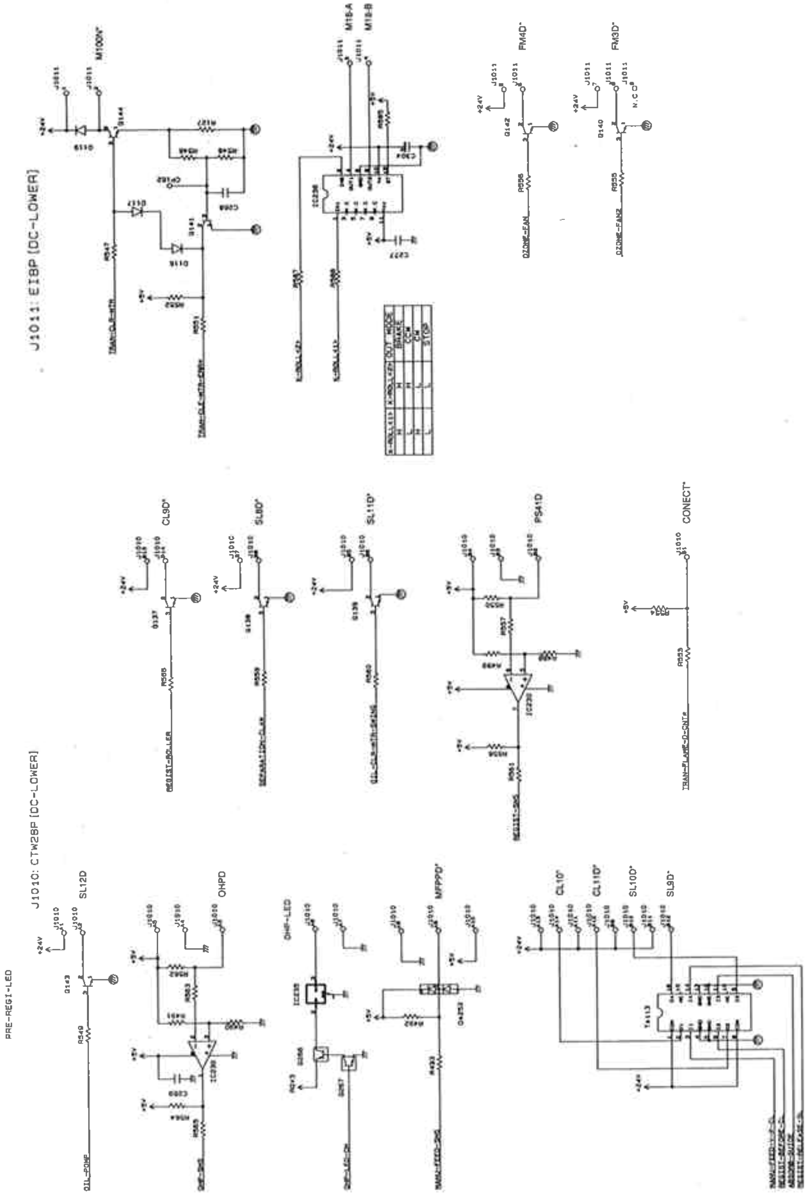
DC controller circuit diagram (CLC800) (16/22)


SL19D*
CL17D*
M150N
PS25D
C4PD
C4LFU
LOW FEED UNIT
J1017 CTW30P
CL18D*
M140N
CL16D*
SL18D*
C3LFU
C3PD
J1022 CTW30P [DC-LOWER]
+24V
+5V
J1022
TA103
TA106

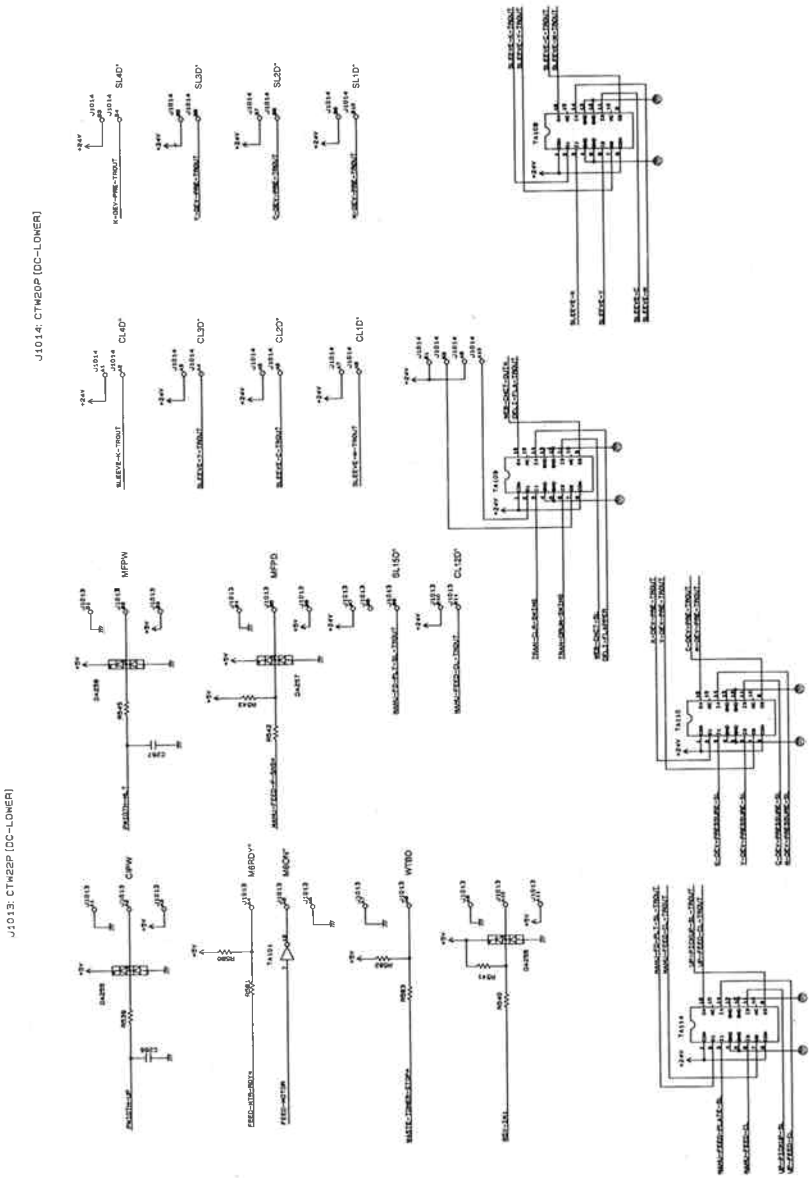
DC controller circuit diagram (CLC800) (17/22)


RESERVE CURCUIT CNCT[J1037]
PS6D
M5SPD1
M5SPD0
M5RDY*
M5ON*
A-LEG
B-LEG
SMTRHP
PS4D
PS5D
J1017: CTW30P [DC-UPPER]
M2SPD1
M2SPD0
M2CLK
M2RDY*
M2ON*
F*/R
M11-A
M11-A*
M11-B
M11-B*
IDOWN*
MOTOR-ERR*
SL7D*

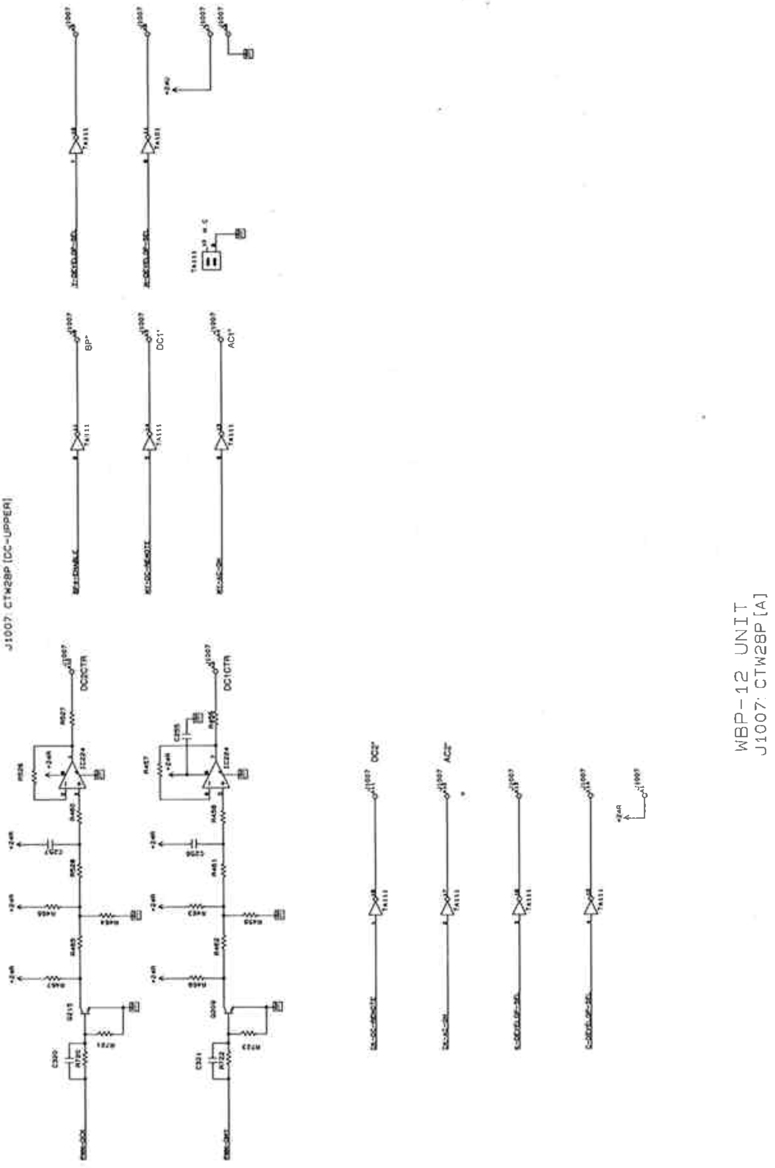
DC controller circuit diagram (CLC800) (18/22)


J1011: EIBP [DC-LOWER]
M100N*
+24V
Q144
D119
R127
R546
R548
CP182
C268
D117
Q141
D116
R547
R552
R551
TRAN-CLN-MTR
TRAN-CLN-MTR-ENB*
M18-A
M18-B
J1011
IC236
C304
R585
+5V
C227
R587
R586
X-ROLL<2>
X-ROLL<1>
X-ROLL<1>
X-ROLL<2>
OUT MODE
BRAKE
CCW
CW
STOP
H
L
FM4D*
FM3D*
Q142
Q140
R556
R555
OZONE-FAN
OZONE-FAN2
N.C.
J1010: CTW28P [DC-LOWER]
CL9D*
SL8D*
SL11D*
PS41D
CONECT*
J1010
Q137
Q138
Q139
R566
R559
R560
REGIST-ROLLER
SEPARATION-CLAW
R557
R558
IC230
R561
REGIST-SNS
R553
TRAN-FLAME-O-CNT*
PRE-REGI-LED
SL12D
Q143
R549
OIL-PUMP
OHPD
R562
R563
IC230
C269
R564
R565
OHP-SNS
OHP-LED
IC235
D256
D257
OHP-LED-ON
MFPPD*
R492
R493
D4252
MANU-FEED-SNS
CL10*
CL11D*
SL10D*
SL9D*
T4113
+24V
MANU-FEED-L-S-CL
REGIST-BEFORE-CL
ABSORB-GUIDE
REGIST-RELEASE-SL

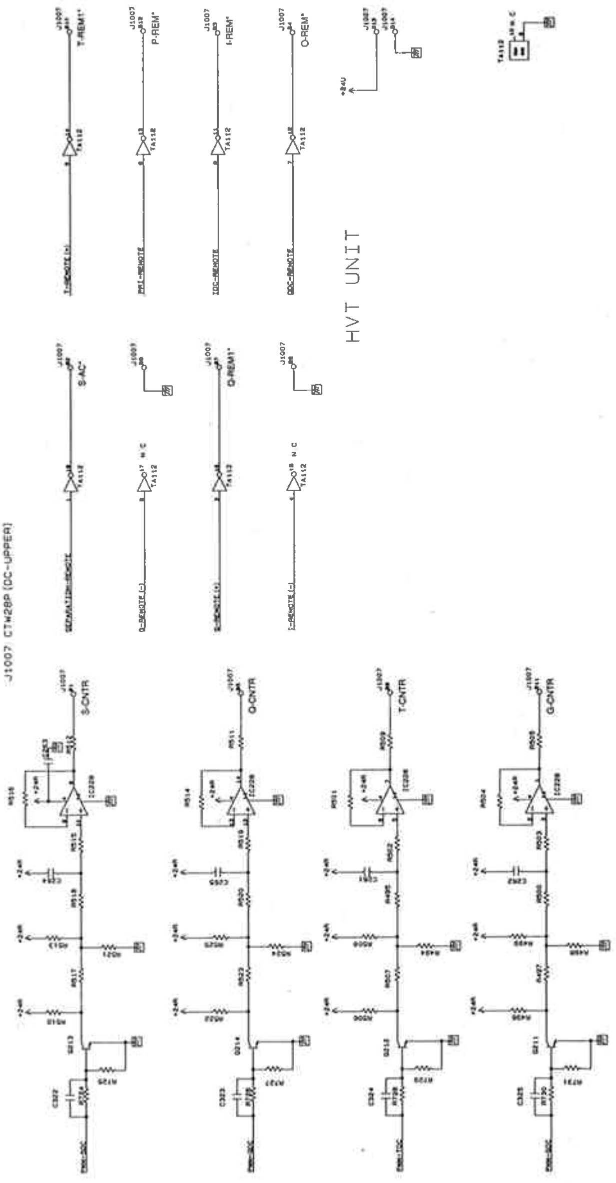
DC controller circuit diagram (CLC800) (19/22)


J1014: CTW20P [DC-LOWER]
J1013: CTW22P [DC-LOWER]
SL4D*
SL3D*
SL2D*
SL1D*
CL4D*
CL3D*
CL2D*
CL1D*
MFPW
MFPD
SL15D*
CL12D*
CIPW
M6RDY*
M6ON*
WTBD
K-DEV-PRE-TROUT
SLEEVE-K-TROUT
+24V
+5V

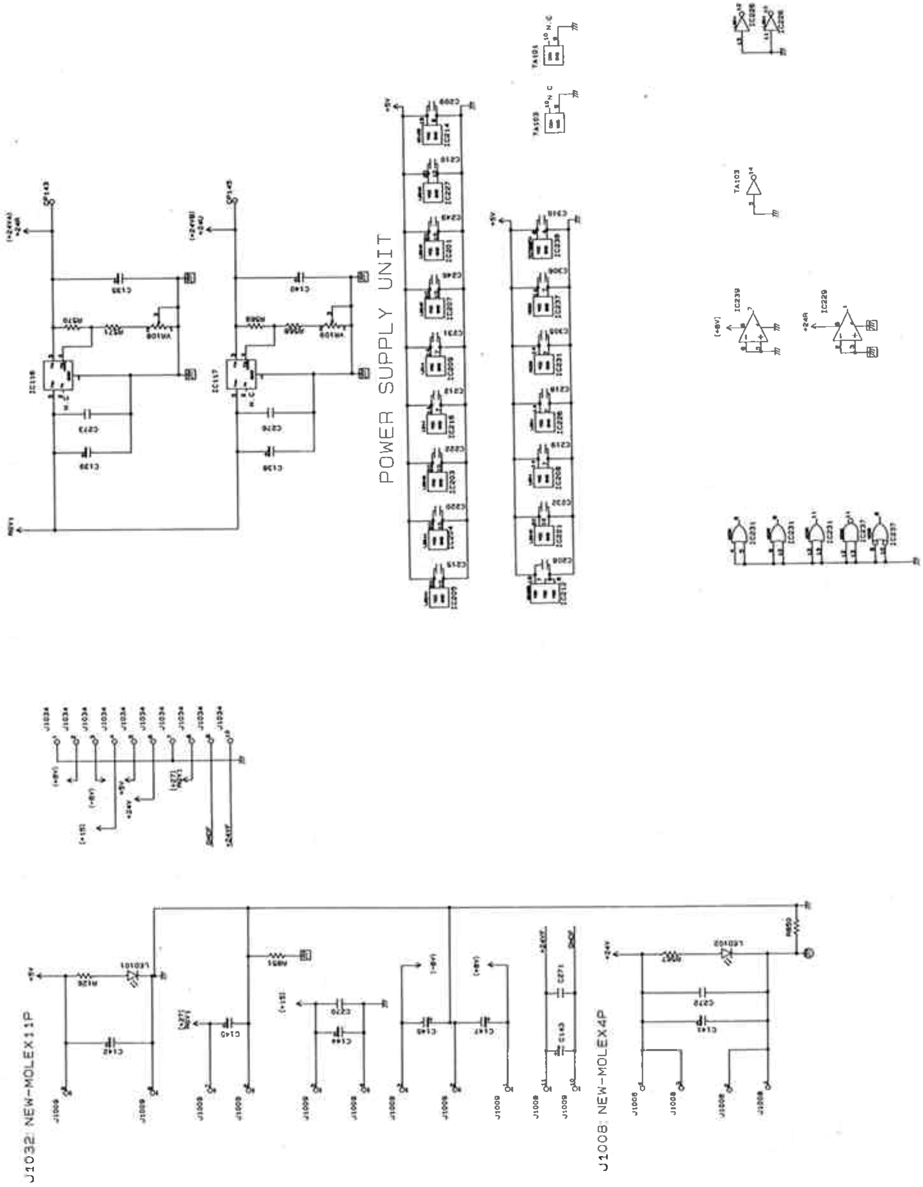
DC controller circuit diagram (CLC800) (20/22)


J1007: CTW28P [DC-UPPER]
DC2CTR
DC1CTR
J1007
IC224
TA111
+24R
BP*
DC1*
AC1*
DC2*
AC2*
WBP-12 UNIT
J1007: CTW28P [A]

DC controller circuit diagram (CLC800) (21/22)

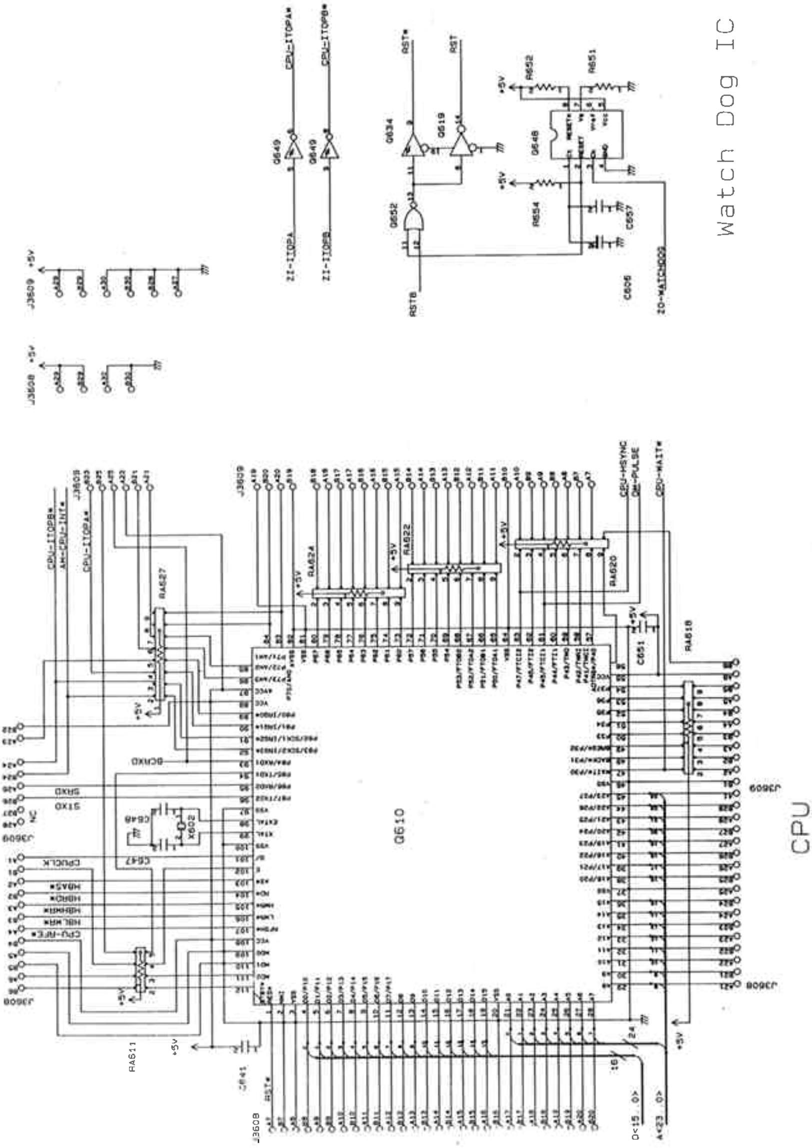

J1007 CTW28P (DC-UPPER)
HVT UNIT
J1007
T-REM1*
P-REM*
I-REM*
O-REM*
S-AC*
O-REM1*
+24V
TA112
N C
S-CNTR
O-CNTR
T-CNTR
G-CNTR
IC228
Q213
Q214
Q212
Q211

DC controller circuit diagram (CLC800) (22/22)

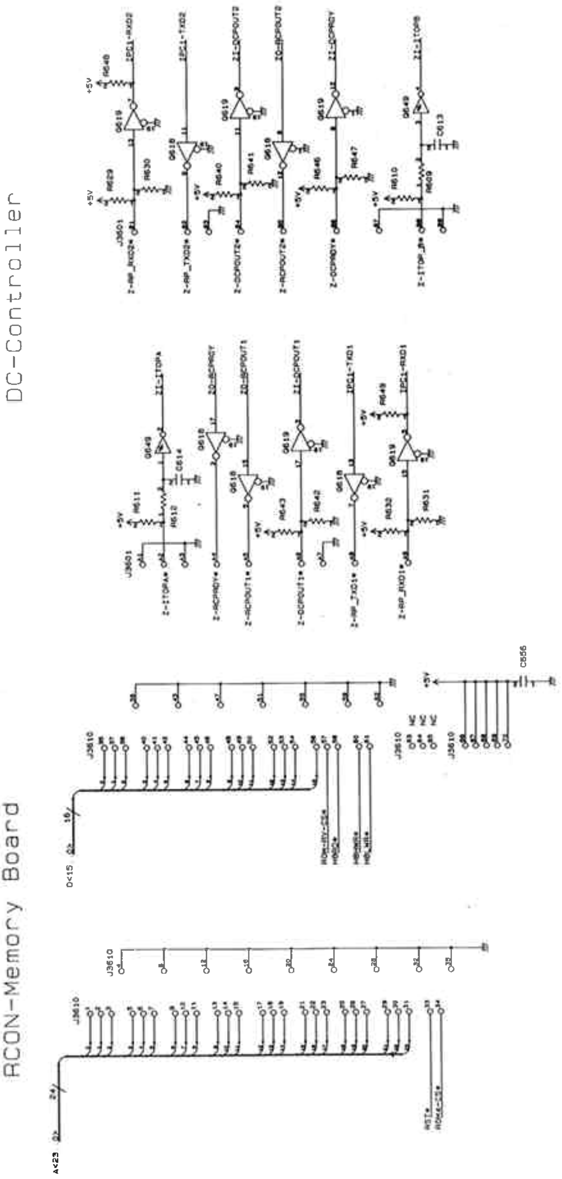

POWER SUPPLY UNIT
J1032: NEW-MOLEX11P
J1008: NEW-MOLEX4P

E. READER CONTROLLER CIRCUIT DIAGRAM

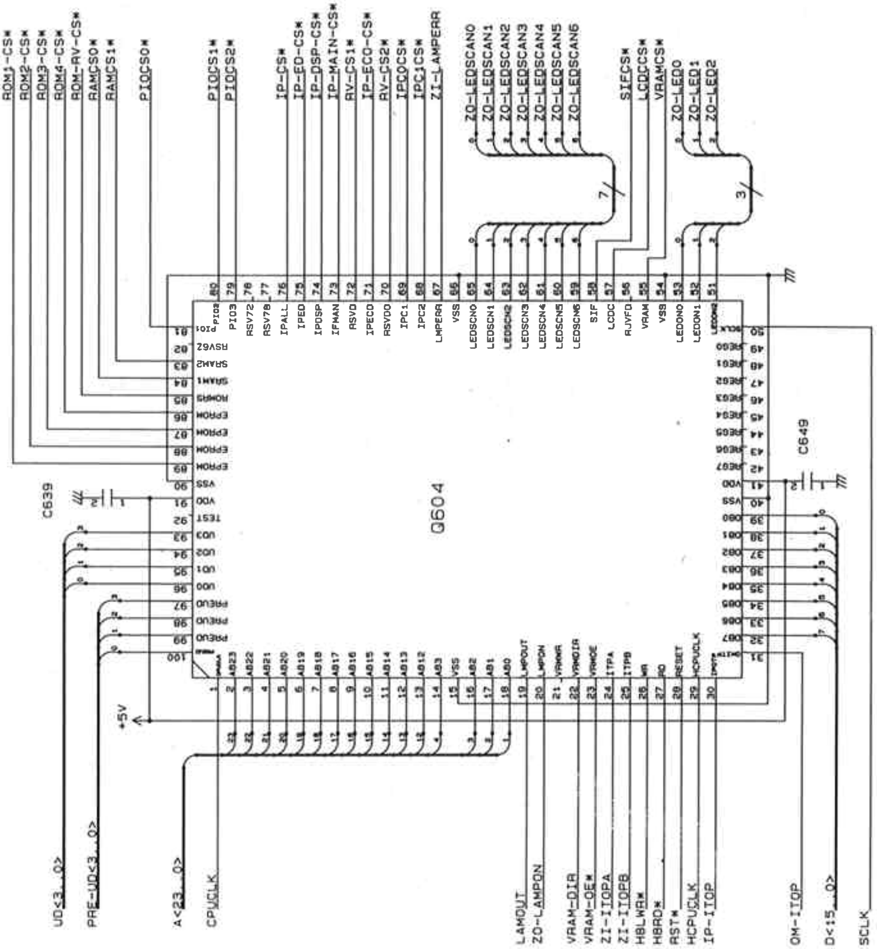
Reader controller circuit diagram (1/13)


Watch Dog IC
CPU
Q610
Q648
Q649
Q634
Q619
Q652
R652
R651
R654
C657
C606
RST*
RST
RSTB
CPU-ITOPA*
CPU-ITOPB*
II-ITOPA
II-ITOPB
IO-WATCHDOG
CPU-HSYNC
DM-PULSE
CPU-WAIT*
RA611
RA618
RA620
RA622
RA624
RA627
C651
C641
C647
C648
X602
J3608
J3609
+5V
SRXD
STXD
BCRXD
CPUCLK
HBAS*
HBRD*
HBHWR*
HBLWR*
CPU-RFE*
AM-CPU-INT*
D<15..0>
A<23..0>

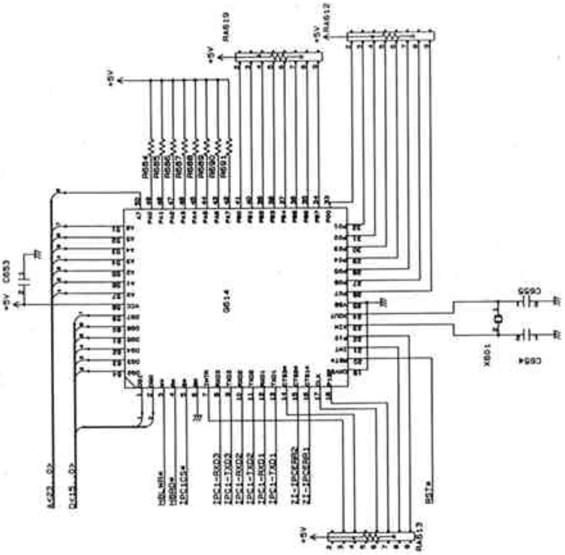
Reader controller circuit diagram (2/13)


DC-Controller
RCON-Memory Board
J3601
+5V
R629
R630
R648
Q619
Q618
Q649
R640
R641
R646
R647
R610
R609
C613
R611
R612
C614
R643
R642
R632
R631
R649
Z-RP_RXD2*
Z-RP_TXD2*
Z-OCPOUT2*
Z-RCPOUT2*
Z-OCPRDY*
Z-ITOP_B*
IPC1-RXD2
IPC1-TXD2
ZI-OCPOUT2
ZO-RCPOUT2
ZI-OCPRDY
ZI-ITOPB
Z-ITOPA*
Z-RCPRDY*
Z-RCPOUT1*
Z-OCPOUT1*
Z-RP_TXD1*
Z-RP_RXD1*
ZI-ITOPA
ZO-RCPRDY
ZO-RCPOUT1
ZI-OCPOUT1
IPC1-TXD1
IPC1-RXD1
J3610
C556
NC
D<15
A<23
RST*

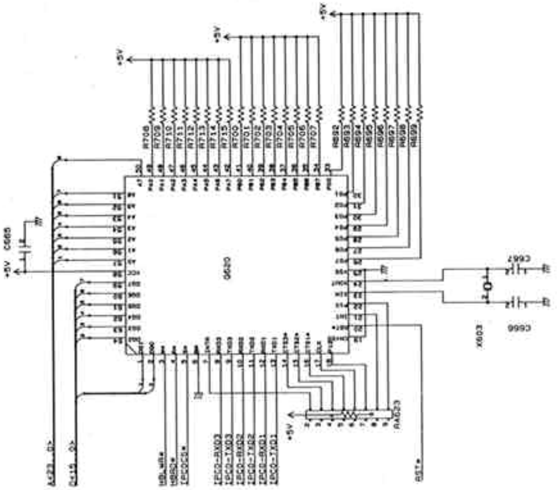
Reader controller circuit diagram (3/13)


ROM1-CS*
ROM2-CS*
ROM3-CS*
ROM4-CS*
ROM-RV-CS*
RAMCS0*
RAMCS1*
PIOCS0*
PIOCS1*
PIOCS2*
IP-CS*
IP-ED-CS*
IP-DSP-CS*
IP-MAIN-CS*
RV-CS1*
IP-ECO-CS*
RV-CS2*
IPC0CS*
IPC1CS*
ZI-LAMPERR
ZO-LEDSCAN0
ZO-LEDSCAN1
ZO-LEDSCAN2
ZO-LEDSCAN3
ZO-LEDSCAN4
ZO-LEDSCAN5
ZO-LEDSCAN6
7
SIFCS*
LCDCCS*
VRAMCS*
ZO-LED0
ZO-LED1
ZO-LED2
3
Q604
C639
C649
+5V
UD<3..0>
PRE-UD<3..0>
A<23..0>
CPUCLK
LAMOUT
ZO-LAMPON
VRAM-DIR
VRAM-OE*
ZI-ITOPA
ZI-ITOPB
HBLWR*
HBRD*
RST*
HCPUCLK
IP-ITOP
OM-ITOP
D<15..0>
SCLK
PIO2
PIO3
RSV72
RSV78
IPALL
IPED
IPDSP
IFMAN
RSVD
IPECO
RSVDO
IPC1
IPC2
LMPERR
VSS
LEDSCN0
LEDSCN1
LEDSCN2
LEDSCN3
LEDSCN4
LEDSCN5
LEDSCN6
SIF
LCDC
RJVFD
VRAM
LEDDN0
LEDDN1
LEDDN2
PIO1
RSV62
SRAM2
SRAM1
ROMRS
EPROM
VDD
TEST
UD3
UD2
UD1
UD0
PREUD
LMPOUT
LMPON
VRAMA
VRMDIR
VRMOE
ITPA
ITPB
WR
RD
RESET
HCPUCLK
SCLK
D00
D01
D02
D03
D04
D05
D06
D07

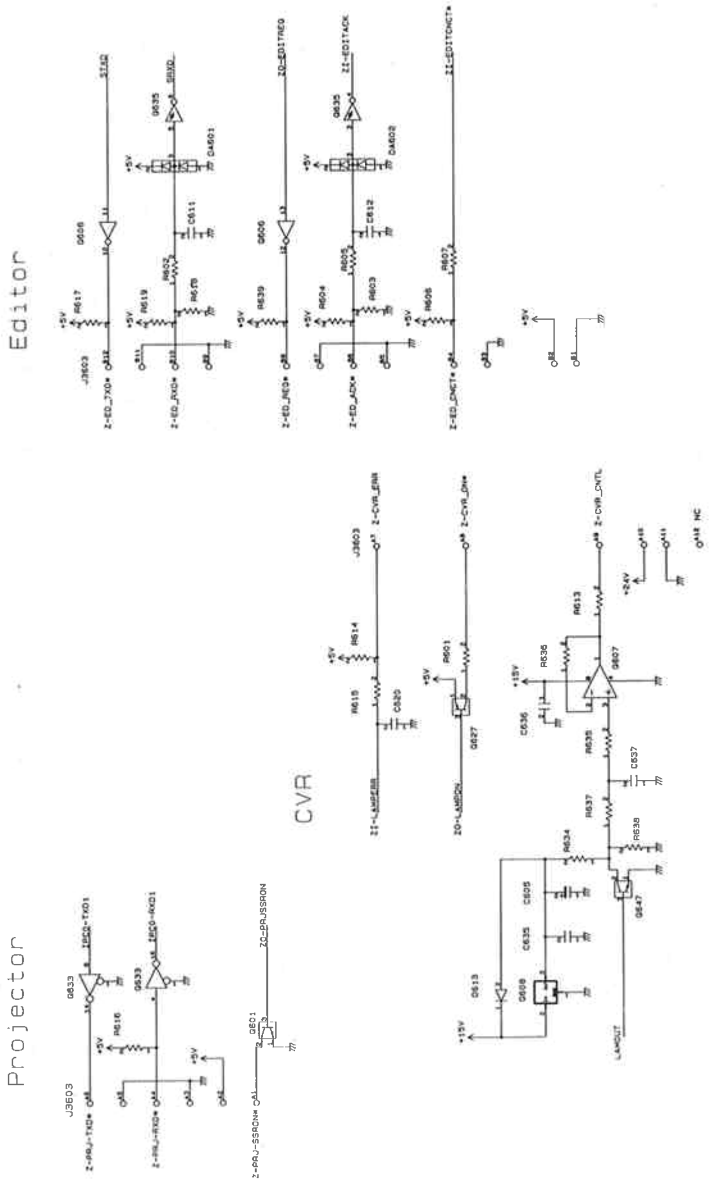
Reader controller circuit diagram (4/13)


Q614
RA619
RA612
RA613
+5V
C653
X601
C654
C655
R684
R685
R686
R687
R688
R689
R690
R691
A<23..0>
D<15..0>
HBLWR*
HBBO*
IPC1CS*
IPC1-RXD3
IPC1-TXD3
IPC1-RXD2
IPC1-TXD2
IPC1-RXD1
IPC1-TXD1
RST*

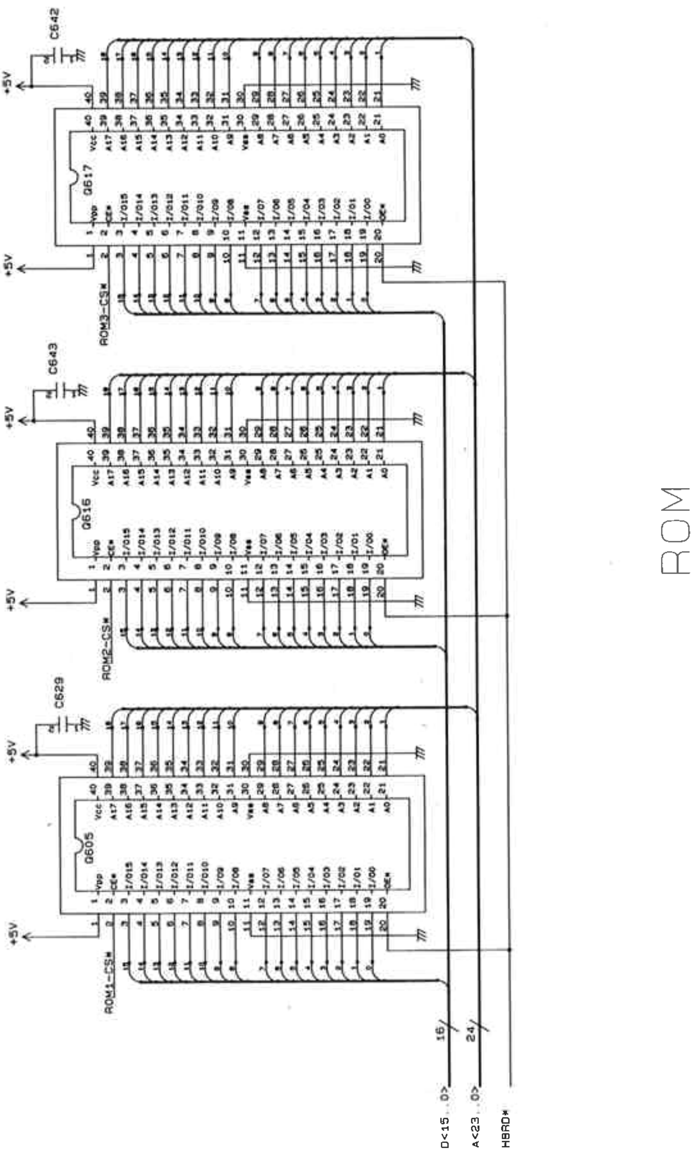
IPC


Q620
RA623
+5V
C665
X603
C666
C667
R708
R709
R710
R711
R712
R713
R714
R715
R700
R701
R702
R703
R704
R705
R706
R707
R692
R693
R694
R695
R696
R697
R698
R699
A<23..0>
D<15..0>
HBLWR*
HBBO*
IPC0CS*
IPC0-RXD3
IPC0-TXD3
IPC0-RXD2
IPC0-TXD2
IPC0-RXD1
IPC0-TXD1
RST*

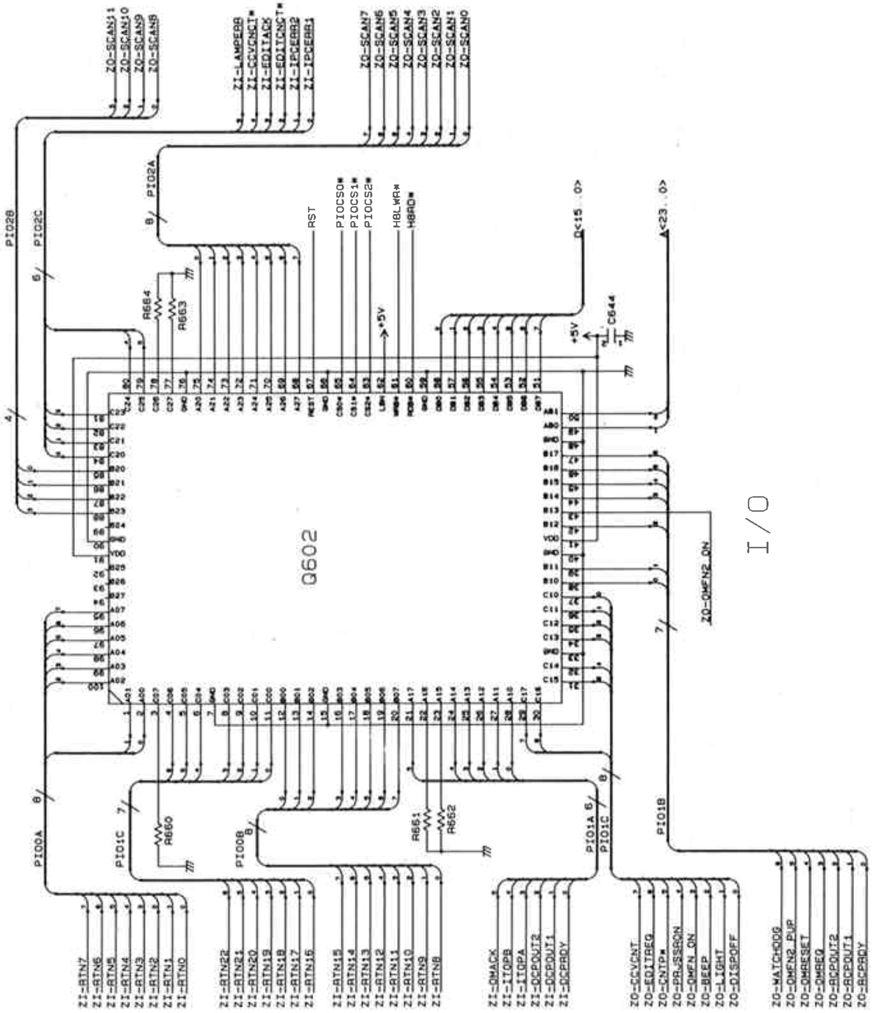
Reader controller circuit diagram (5/13)


Editor
J3603
Z-ED_TXD*
Z-ED_RXD*
Z-ED_REQ*
Z-ED_ACK*
Z-ED_CNCT*
Q606
Q635
QA601
QA602
C611
C612
R617
R619
R602
R678
R639
R604
R605
R603
R606
R607
STXD
SRXD
ZO-EDITREQ
ZI-EDITACK
ZI-EDITCNCT*
+5V
CVR
J3603
Z-CVR_ERR
Z-CVR_ON*
Z-CVR_CNTL
ZI-LAMPERR
ZO-LAMPON
R614
R615
C620
R601
Q627
R613
R636
Q607
+15V
C636
R635
C637
R637
R638
R634
Q647
C605
C635
Q608
D613
LAMPOUT
+24V
NC
Projector
J3603
Z-PRJ-TXD*
Z-PRJ-RXD*
Z-PRJ-SSRON*
Q633
R616
IBC0-TXD1
IBC0-RXD1
Q601
ZO-PRJSSRON

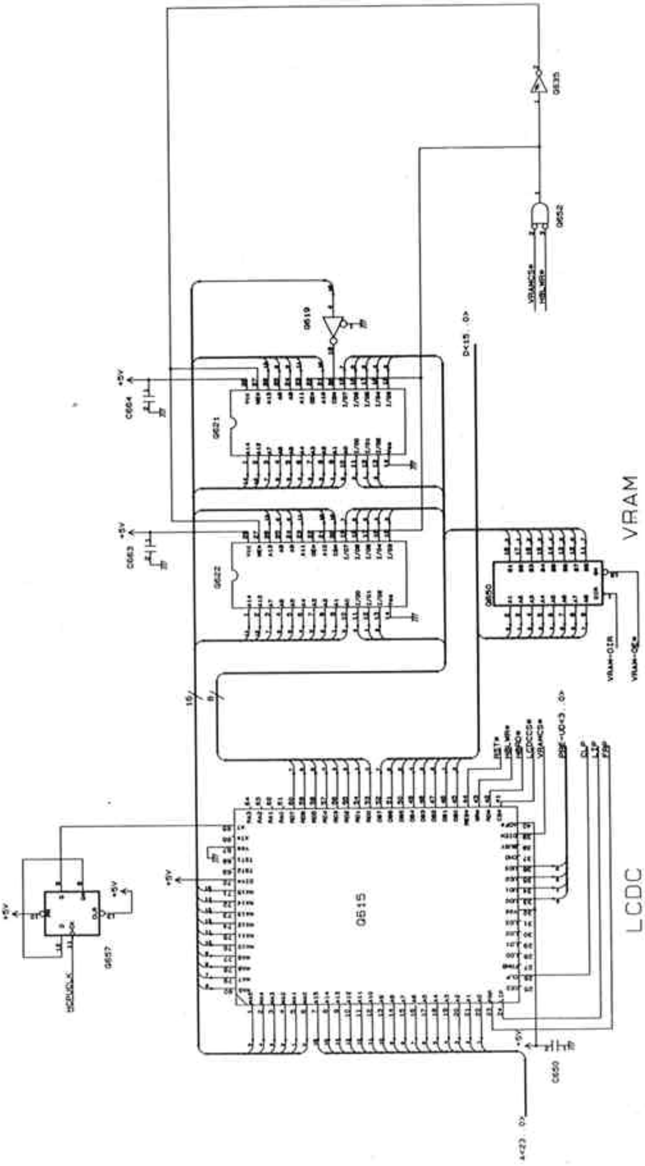
Reader controller circuit diagram (6/13)


C642
C643
C629
+5V
Q617
Q616
Q605
ROM3-CS*
ROM2-CS*
ROM1-CS*
Vpp
CE*
I/O15
I/O14
I/O13
I/O12
I/O11
I/O10
I/O9
I/O8
Vss
I/O7
I/O6
I/O5
I/O4
I/O3
I/O2
I/O1
I/O0
OE*
Vcc
A17
A16
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
16
24
D<15..0>
A<23..0>
HBRD*
ROM

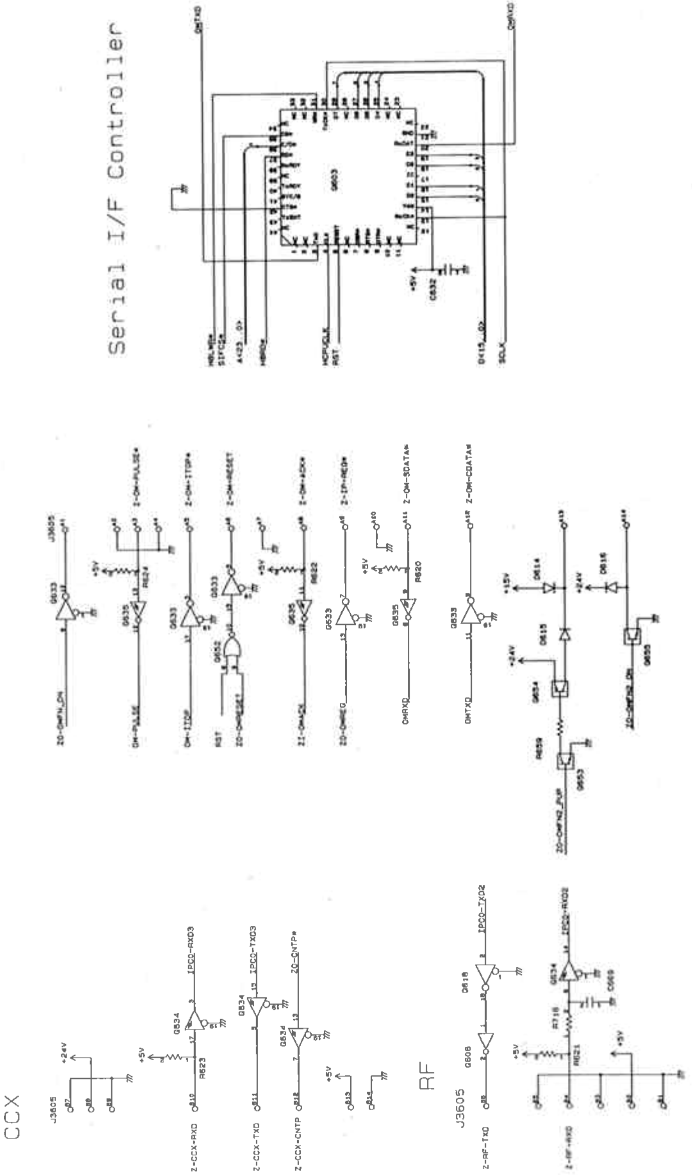
Reader controller circuit diagram (7/13)


ZO-SCAN11
ZO-SCAN10
ZO-SCAN9
ZO-SCAN8
ZI-LAMPERR
ZI-CCVCNCT*
ZI-EDITACK
ZI-EDITCNCT*
ZI-IPCERR2
ZI-IPCERR1
ZO-SCAN7
ZO-SCAN6
ZO-SCAN5
ZO-SCAN4
ZO-SCAN3
ZO-SCAN2
ZO-SCAN1
ZO-SCAN0
PIO2B
PIO2C
PIO2A
RST
PIOCS0*
PIOCS1*
PIOCS2*
HBLWR*
HBRD*
D<15..0>
A<23..0>
R664
R663
+5V
C644
Q602
I/O
ZO-OMFN2_ON
PIO0A
PIO1C
R660
PIO0B
R661
R662
PIO1A
PIO1C
PIO1B
ZI-RTN7
ZI-RTN6
ZI-RTN5
ZI-RTN4
ZI-RTN3
ZI-RTN2
ZI-RTN1
ZI-RTN0
ZI-RTN22
ZI-RTN21
ZI-RTN20
ZI-RTN19
ZI-RTN18
ZI-RTN17
ZI-RTN16
ZI-RTN15
ZI-RTN14
ZI-RTN13
ZI-RTN12
ZI-RTN11
ZI-RTN10
ZI-RTN9
ZI-RTN8
ZI-OMACK
ZI-ITOPB
ZI-ITOPA
ZI-OCPOUT3
ZI-OCPOUT1
ZI-OCPRDY
ZO-CCVCNT
ZO-EDITREQ
ZO-CNTP*
ZO-PRJSSRON
ZO-OMFN_ON
ZO-BEEP
ZO-LIGHT
ZO-DISPOFF
ZO-WATCHDOG
ZO-OMFN2_PUP
ZO-OMRESET
ZO-OMREQ
ZO-RCPOUT2
ZO-RCPOUT1
ZO-RCPRDY

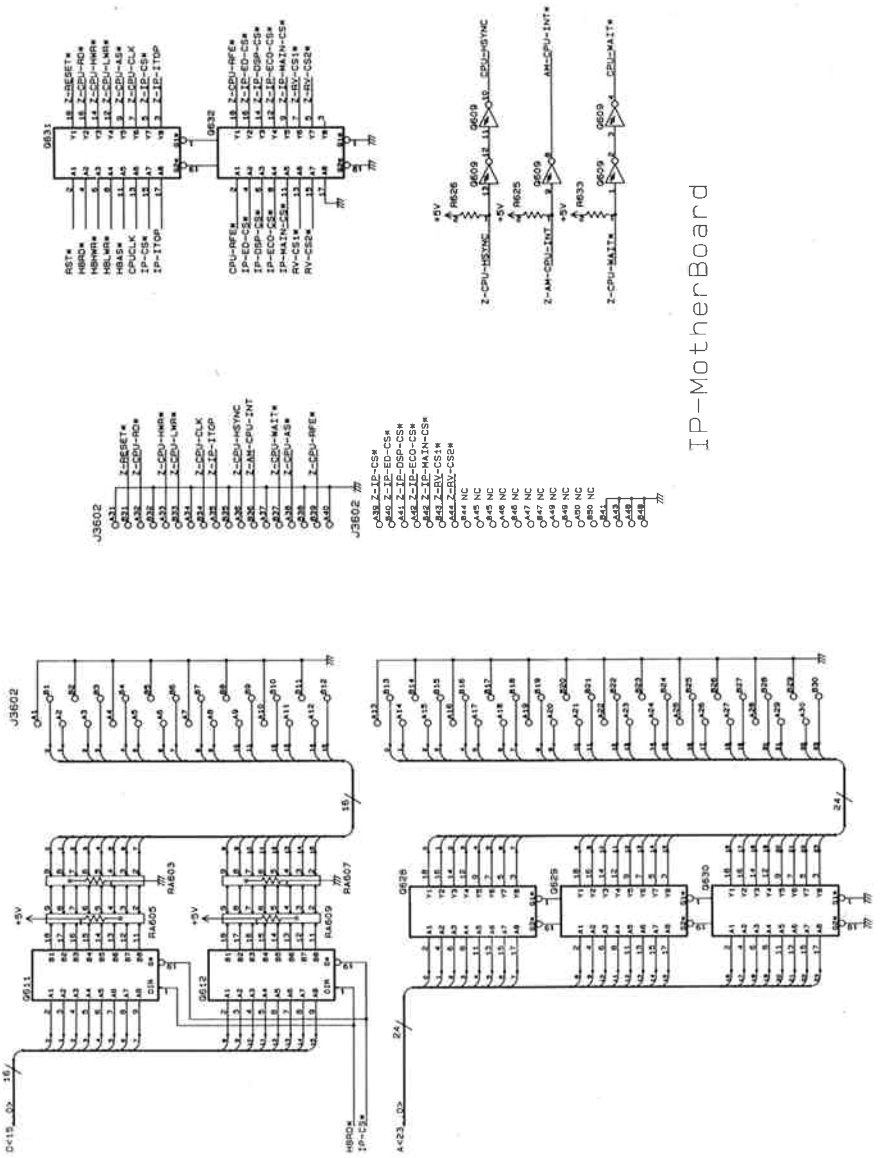
Reader controller circuit diagram (8/13)


Q635
Q652
VRAMCS*
HBLWR*
Q619
D<15..0>
C664
+5V
Q621
C663
Q622
VRAM
Q650
VRAM-DIR
VRAM-OE*
LCDC
Q515
Q657
C650
A<23..0>

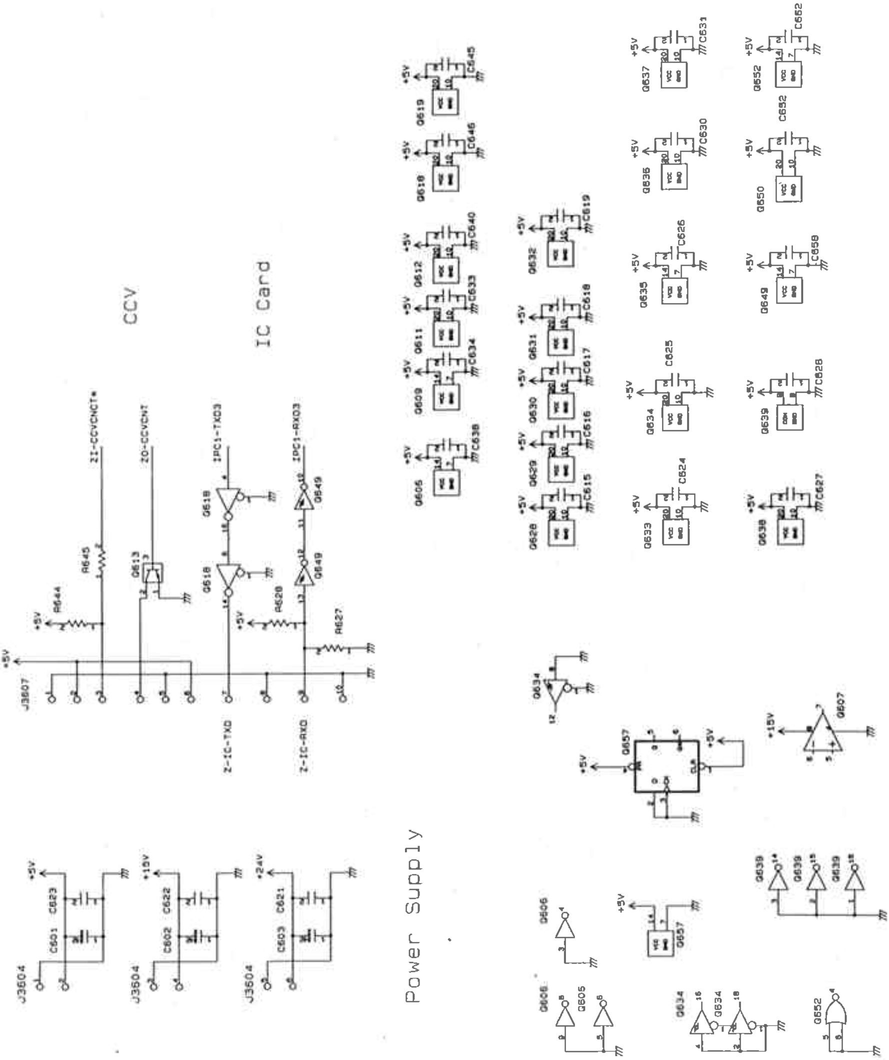
Reader controller circuit diagram (9/13)


Serial I/F Controller
Q603
C632
+5V
OMTXD
OMRXD
MRLWR*
SIFCS*
A<23..0>
MRRD*
MCPUCLK
RST
D<15..0>
SCLK
J3605
Q633
Q635
Q652
R624
R622
R620
ZO-OMFN_ON
OM-PULSE
OM-ITOP
ZO-OMRESET
ZI-OMACK
ZO-OMREQ
Z-OM-PULSE*
Z-OM-ITOP*
Z-OM-RESET
Z-OM-ACK*
Z-IP-REQ*
Z-OM-SDATA*
Z-OM-CDATA*
+15V
+24V
D614
D615
D616
Q653
Q654
Q655
R659
ZO-OMFN2_PUP
ZO-OMFN2_ON
CCX
Q534
R623
IPCO-RXD3
IPCO-TXD3
ZO-CNTP*
Z-CCX-RXD
Z-CCX-TXD
Z-CCX-CNTP
RF
Q618
Q608
R716
R621
C669
IPCO-TXD2
IPCO-RXD2
Z-RF-TXD
Z-RF-RXD

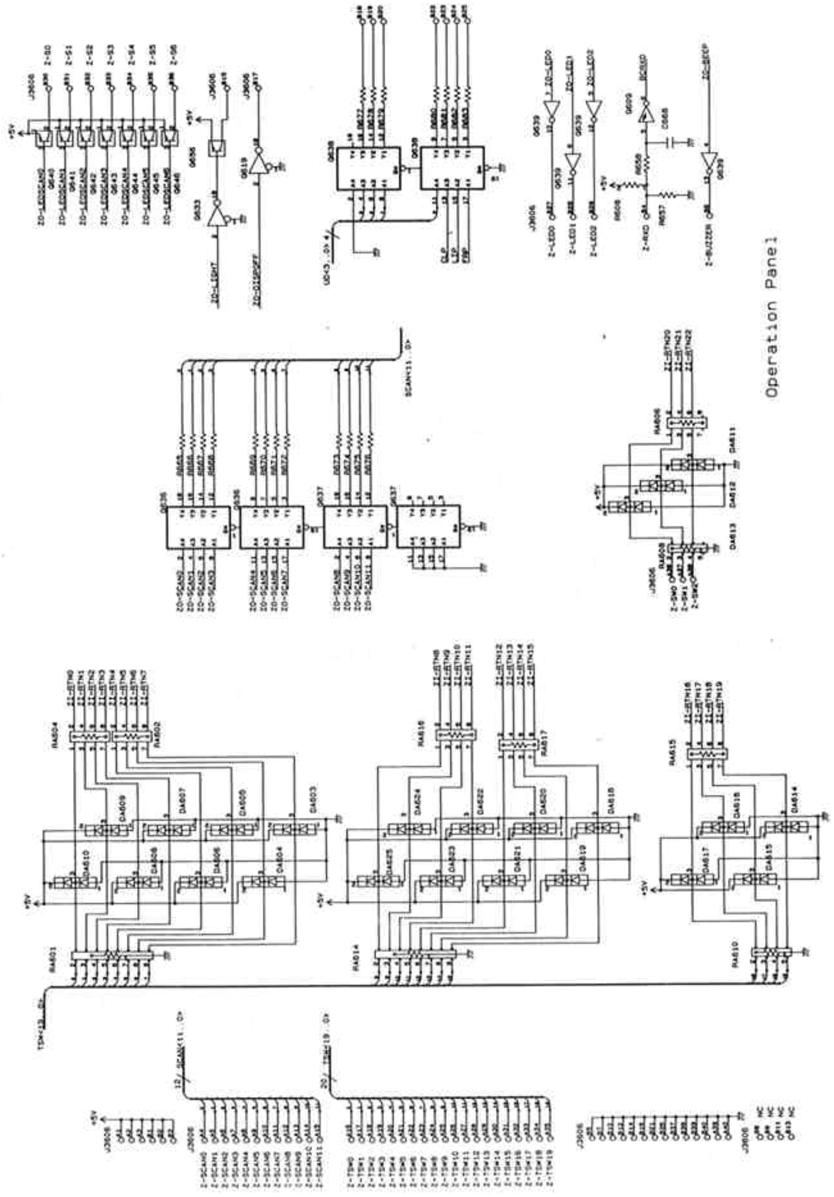
Reader controller circuit diagram (10/13)


IP-MotherBoard
Q631
Q632
Q609
R626
R625
R633
+5V
RST*
HBRD*
HBHWR*
HBLWR*
HBAS*
CPUCLK
IP-CS*
IP-ITOP
Z-RESET*
Z-CPU-RD*
Z-CPU-HWR*
Z-CPU-LWR*
Z-CPU-AS*
Z-CPU-CLK
Z-IP-CS*
Z-IP-ITOP
CPU-RFE*
IP-ED-CS*
IP-DSP-CS*
IP-ECO-CS*
IP-MAIN-CS*
RV-CS1*
RV-CS2*
Z-CPU-RFE*
Z-IP-ED-CS*
Z-IP-DSP-CS*
Z-IP-ECO-CS*
Z-IP-MAIN-CS*
Z-RV-CS1*
Z-RV-CS2*
Z-CPU-HSYNC
CPU-HSYNC
Z-AM-CPU-INT
AM-CPU-INT*
Z-CPU-WAIT*
CPU-WAIT*
J3602
Z-CPU-HSYNC
Z-AM-CPU-INT
Z-CPU-WAIT*
Z-CPU-AS*
NC
Q611
Q612
RA603
RA605
RA607
RA609
Q628
Q629
Q630
D<15..0>
A<23..0>
HBRD*
IP-CS*
16
24

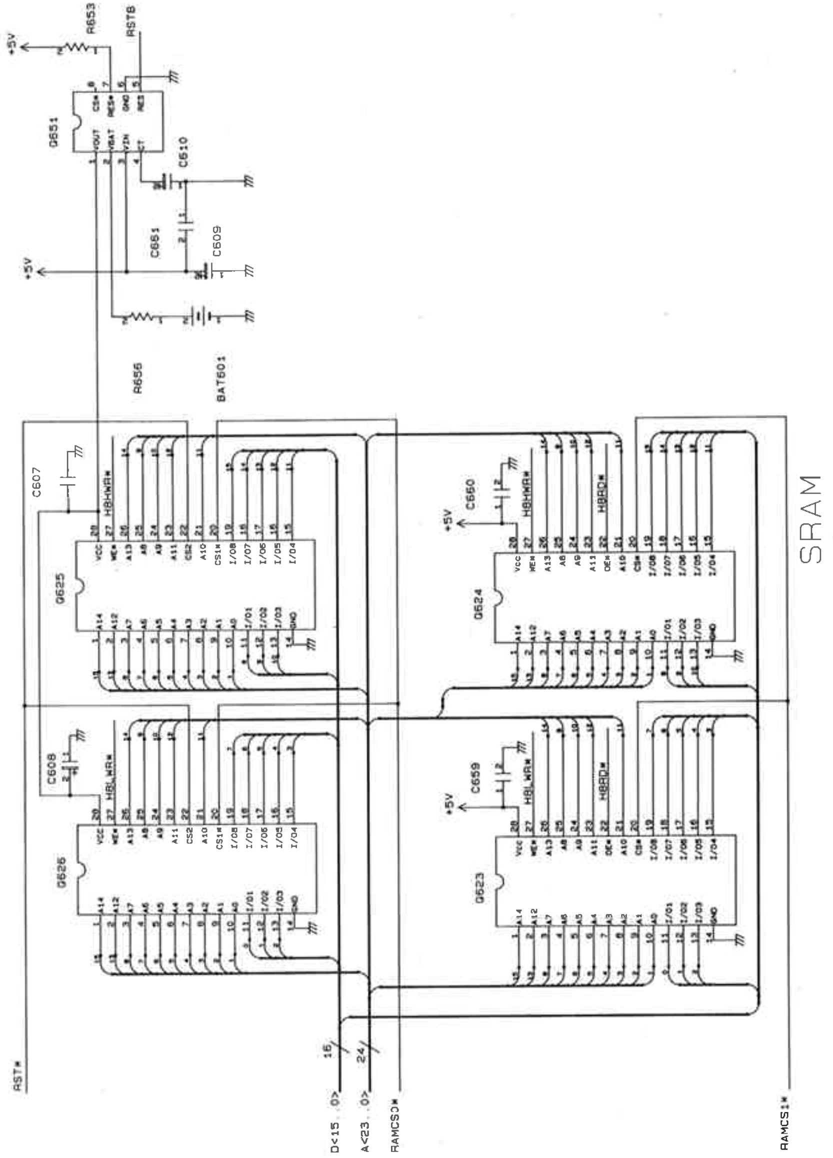
Reader controller circuit diagram (11/13)


CCV
IC Card
Power Supply
J3607
J3604
+5V
+15V
+24V
R644
R645
R626
R627
Q613
Q618
Q649
2I-CCVCNCT*
2O-CCVCNT
IPC1-TXD3
IPC1-RXD3
2-IC-TXD
2-IC-RXD
C601
C623
C602
C622
C603
C621
Q605
Q606
Q609
Q611
Q612
Q618
Q619
Q628
Q629
Q630
Q631
Q632
Q633
Q634
Q635
Q636
Q637
Q638
Q639
Q649
Q650
Q652
Q657
Q607
C638
C634
C633
C640
C646
C645
C615
C616
C617
C618
C619
C624
C625
C626
C630
C631
C627
C628
C658
C652
VCC
GND

Reader controller circuit diagram (12/13)

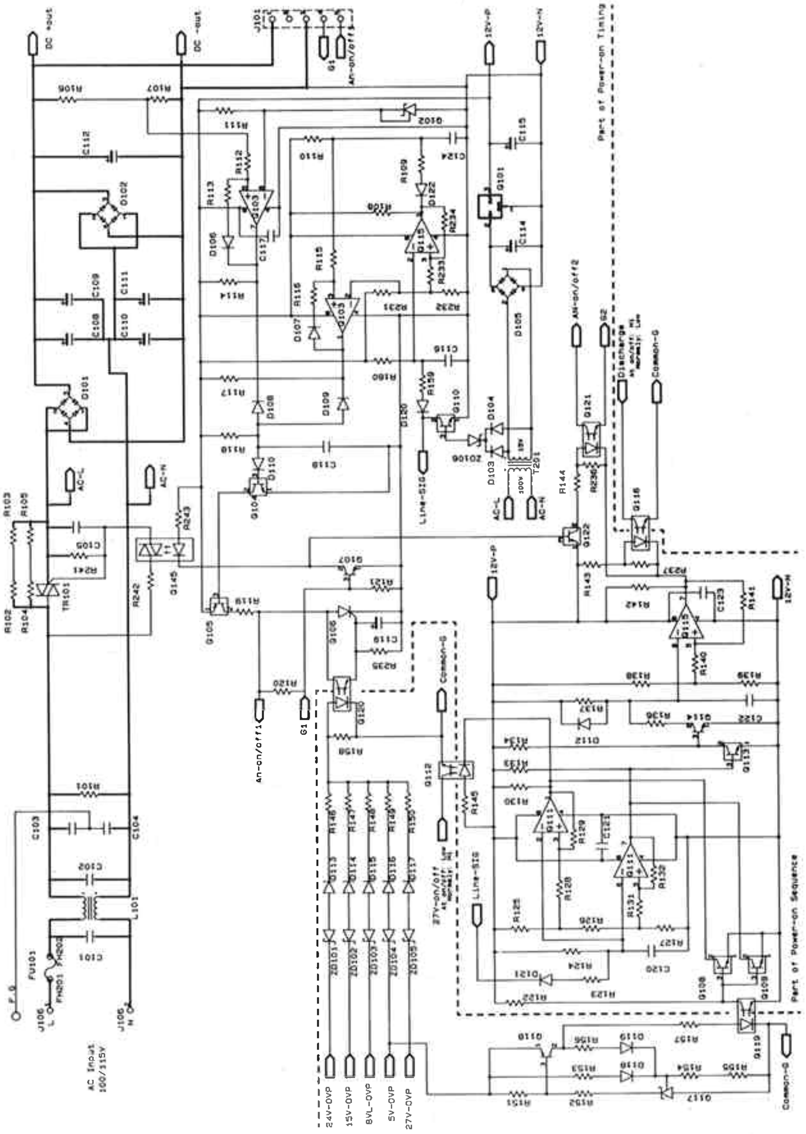

Operation Panel
J3606
+5V
SCAN<11..0>
TSW<19..0>
UD45..D0
RA601
RA614
RA610
RA604
RA602
RA616
RA617
RA615
RA606
RA608

Reader controller circuit diagram (13/13)

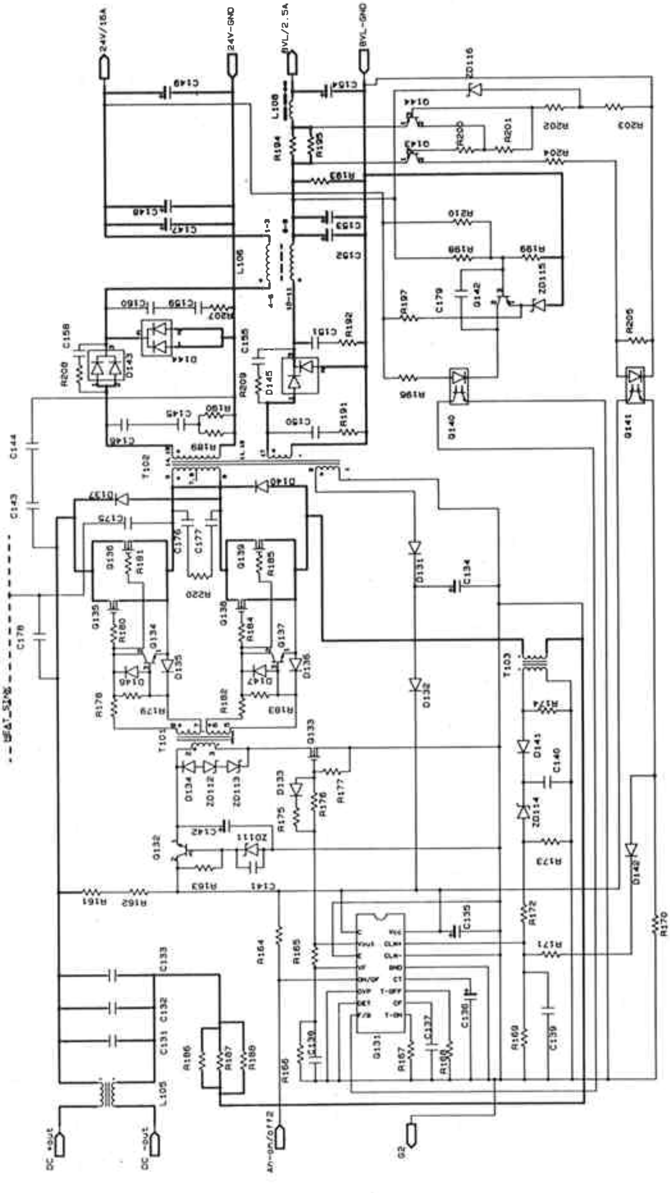

+5V
R653
RST8
Q651
VOUT
VBAT
VIN
CT
CS*
RES*
GND
RES
C610
C661
C609
+5V
R656
BAT601
C607
HBHWR*
Q625
C608
HBLWR*
Q626
+5V
C660
HBHWR*
HBRD*
Q624
+5V
C659
HBLWR*
HBRD*
Q623
SRAM
16
24
RST*
D<15..0>
A<23..0>
RAMCS0*
RAMCS1*

F. MAIN POWER SUPPLY CIRCUIT DIAGRAM

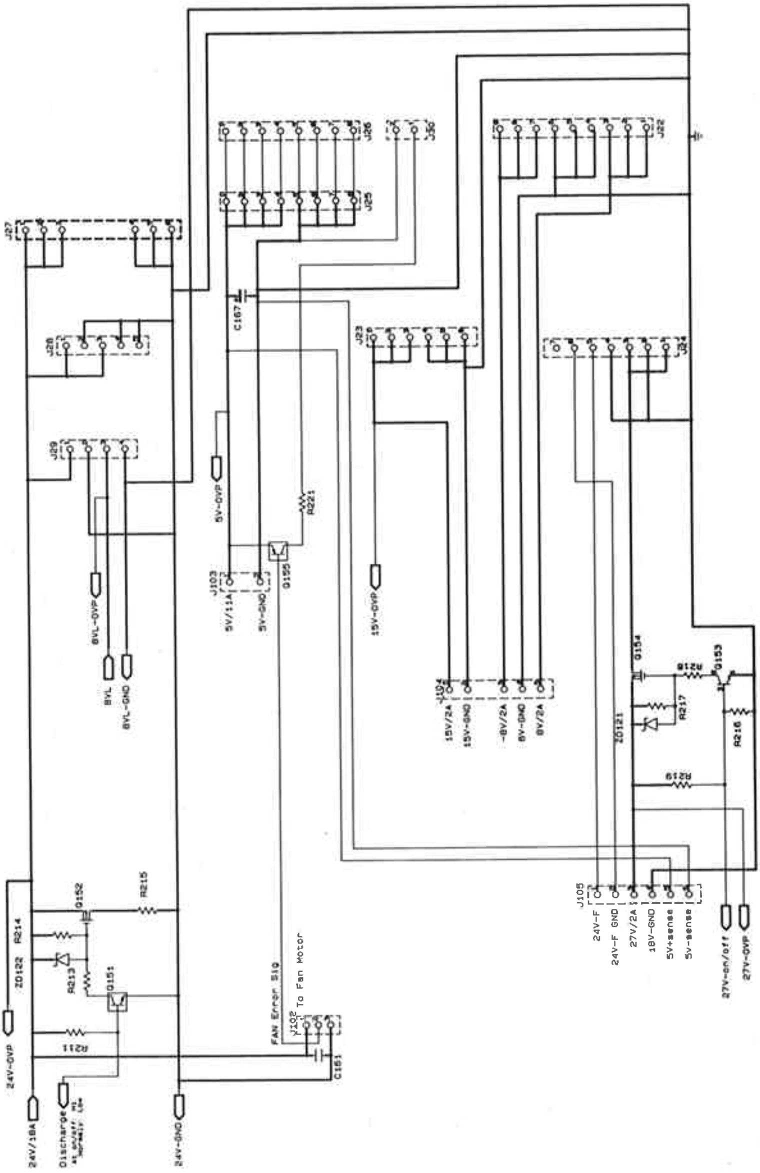
Main power supply circuit diagram (1/5)


DC +out
DC -out
J101
G1
An-on/off1
12V-P
12V-N
Part of Power-on Timing
AC-L
AC-N
Line-SIG
An-on/off2
G2
Discharge
Common-G
T201
100V
18V
27V-on/off
24V-OVP
15V-OVP
8VL-OVP
5V-OVP
27V-OVP
Part of Power-on Sequence
AC Input 100/115V
J106 L
J106 N
F.G
FU101
L101
TR101
D101
D102
D103
D104
D105

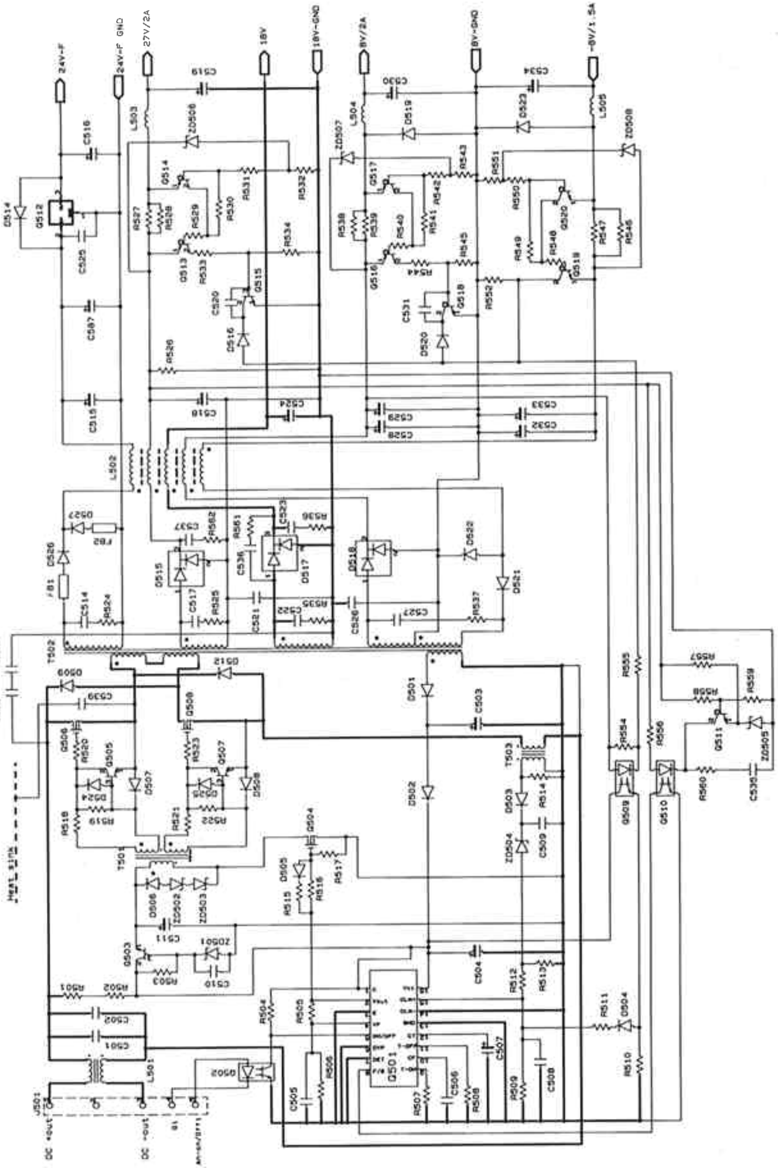
Main power supply circuit diagram (2/5)


24V/15A
24V-GND
8VL/2.5A
8VL-GND
DC +out
DC -out
AC-on/off2
G2
HEAT_SINK
T101
T102
T103
L105
L106
L108
Q131
Q132
Q133
Q134
Q135
Q136
Q137
Q138
Q139
Q140
Q141
Q142
Q143
Q144
D131
D132
D133
D134
D135
D136
D137
D140
D141
D142
D143
D144
D145
D146
D147
ZD111
ZD112
ZD113
ZD114
ZD115
ZD116
Vcc
Vout
CLM+
CLM-
GND
CT
T-OFF
T-ON
ON/OF
OVP
DET
F/B

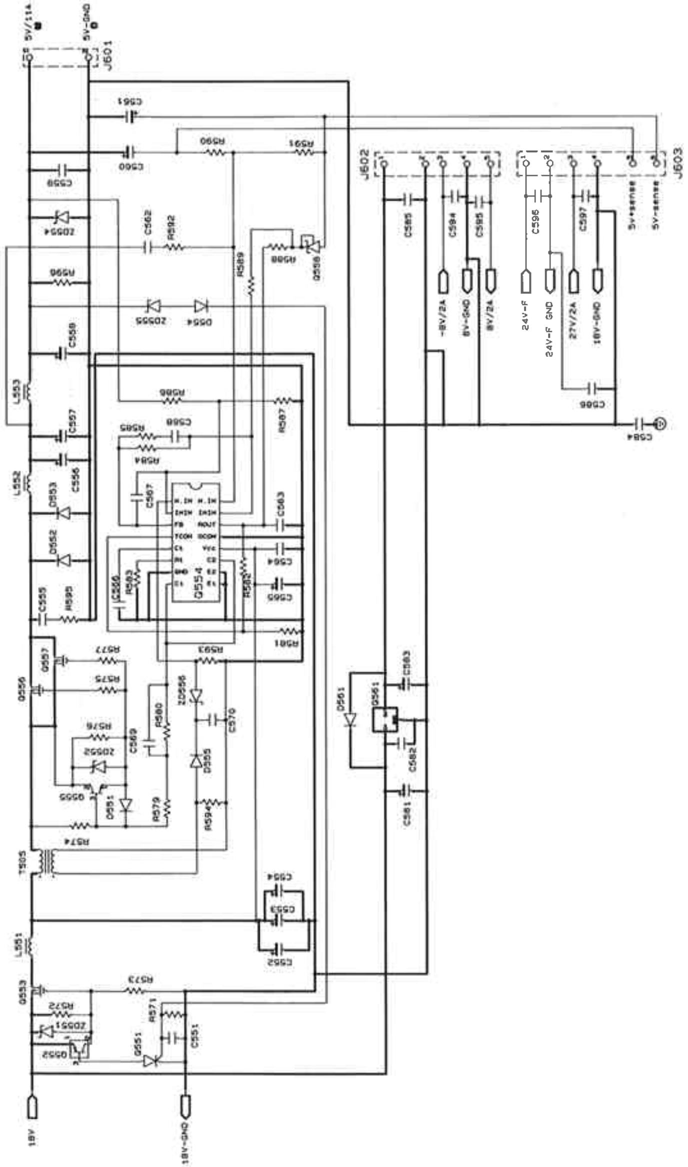
Main power supply circuit diagram (3/5)


J27
J28
J29
J26
J25
J30
J22
J23
J24
C167
5V-OVP
R221
Q155
J103
5V/11A
5V-GND
15V-OVP
8VL-OVP
8VL
8VL-GND
J104
15V/2A
15V-GND
-8V/2A
8V-GND
8V/2A
Q154
R218
Q153
R217
ZD121
R216
R219
J105
24V-F
24V-F GND
27V/2A
18V-GND
5V+sense
5V-sense
27V-on/off
27V-OVP
Q152
R215
R214
ZD122
R213
Q151
R211
Fan Error Sig
To Fan Motor
J102
C151
24V-OVP
24V/18A
Discharge
24V-GND

Main power supply circuit diagram (4/5)

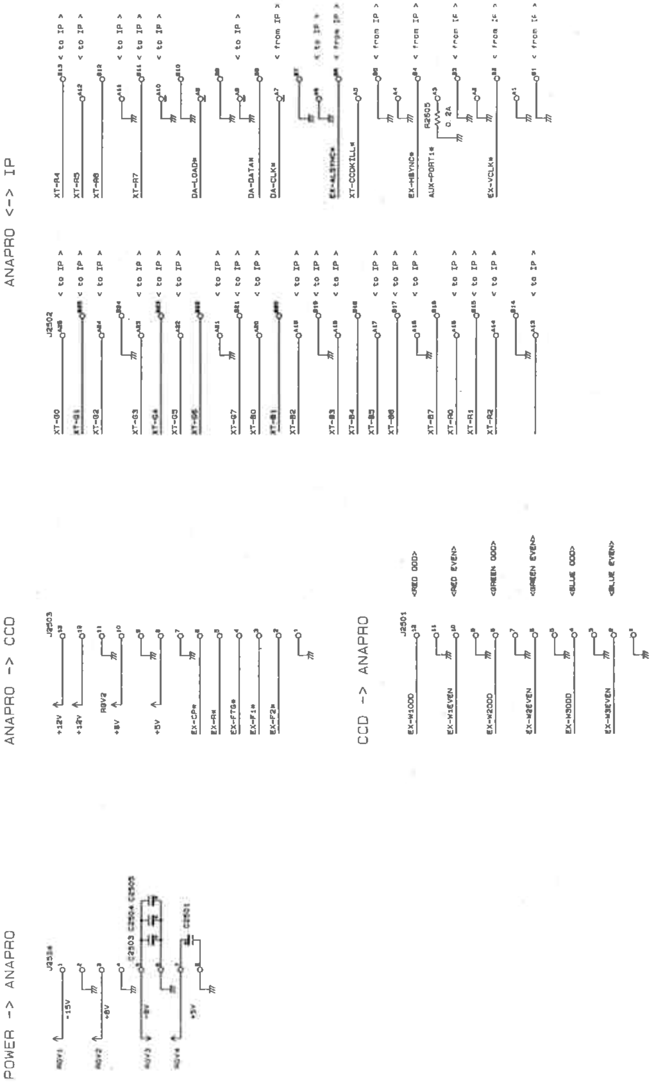

24V-F
24V-F GND
27V/2A
18V
18V-GND
8V/2A
8V-GND
-8V/1.5A
Heat sink
T501
T502
T503
L501
L502
L503
L504
L505
Q501
J501
DC +out
DC -out

Main power supply circuit diagram (5/5)

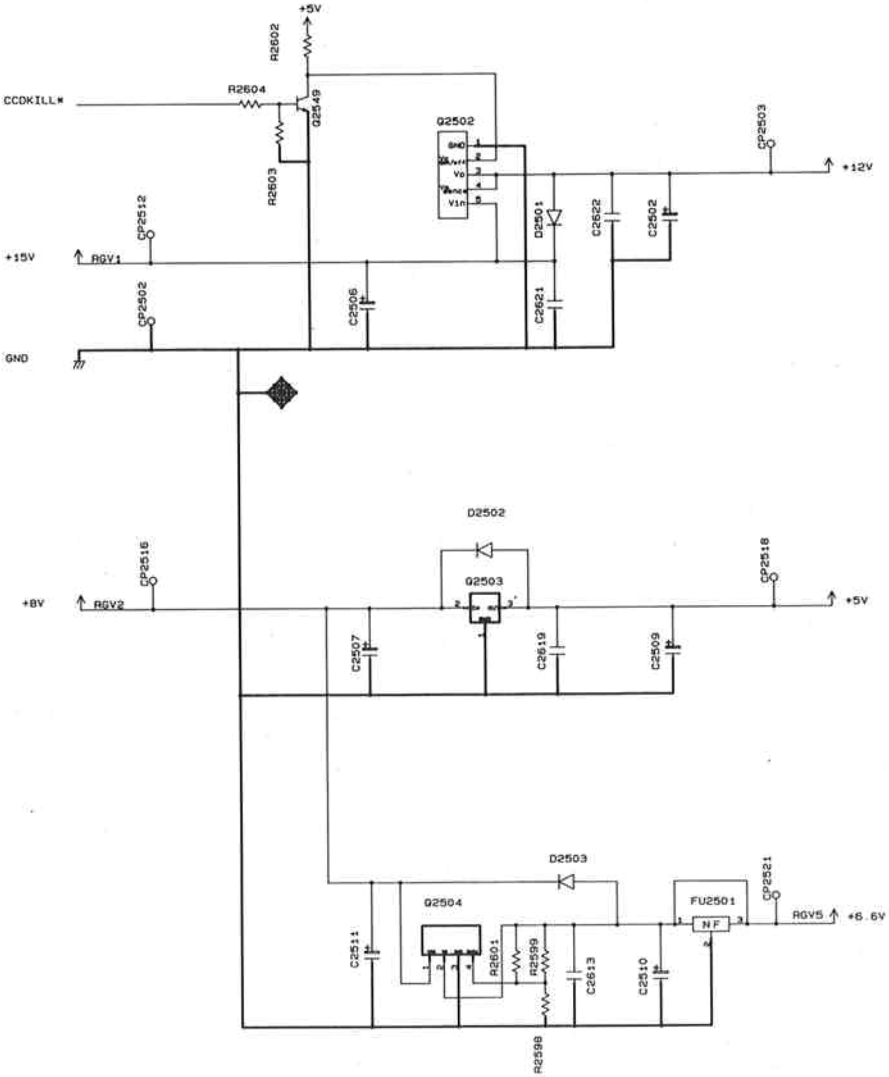

5V/11A
5V-GND
J601
C561
C560
R590
R591
J602
J603
C559
ZD554
C562
R592
R596
R589
R588
Q558
ZD555
D554
C558
L553
R586
R587
C557
C568
R585
R584
L552
C556
D553
C567
D552
C555
R595
C566
R583
Q554
H.IN
INSW
FB
TCON
Ct
Rt
GND
C1
AOUT
SCON
Vcc
C2
E2
E1
R582
C563
C564
C565
R581
R593
R577
Q557
Q556
R575
ZD556
R580
R576
C569
C570
ZD552
D555
Q555
D551
R579
R594
R574
T505
C554
C553
C552
L551
R573
Q553
R572
ZD551
R571
Q552
Q551
C551
18V
18V-GND
C585
C584
C595
C596
C597
-8V/2A
8V-GND
8V/2A
24V-F
24V-F GND
27V/2A
18V-GND
5V+sense
5V-sense
C586
D561
Q561
C583
C582
C581

G. ANALOG PROCESSOR CIRCUIT DIAGRAM

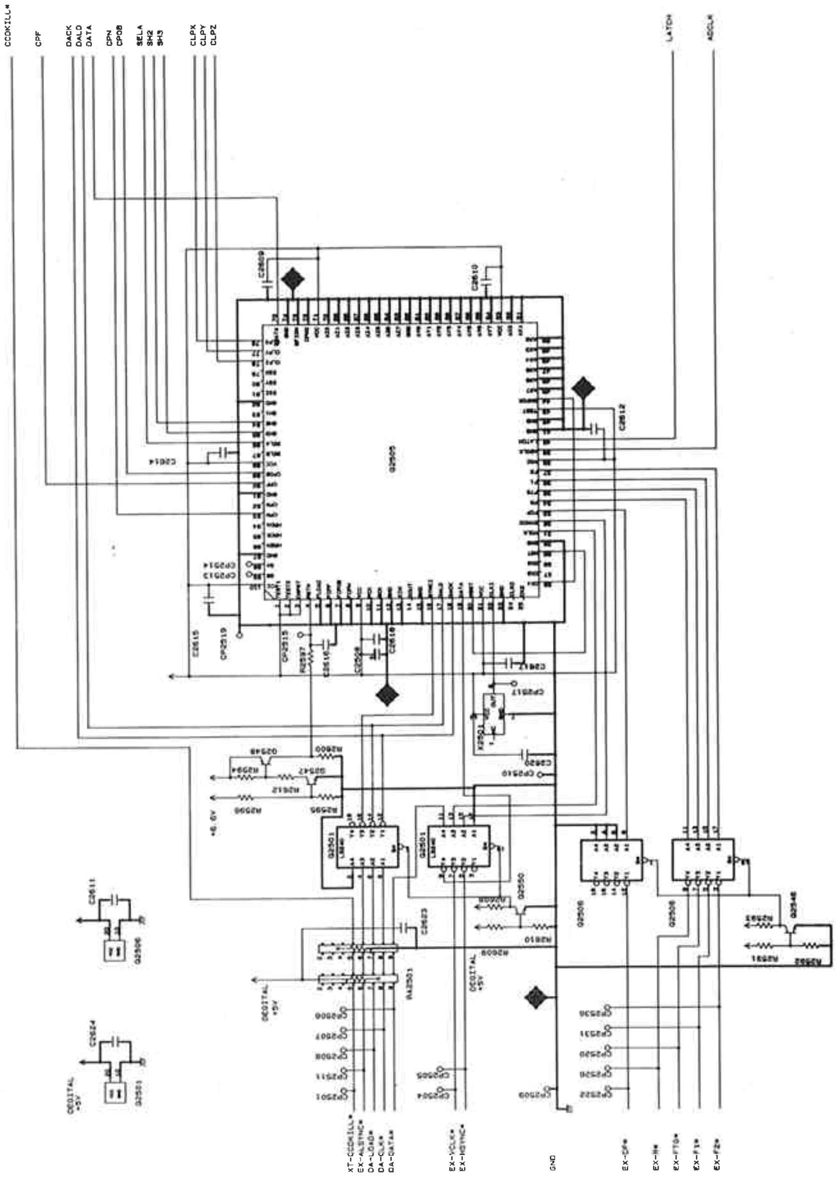
Analog processor circuit diagram (1/5)


ANAPRO <-> IP
J2502
XT-G0
XT-G1
XT-G2
XT-G3
XT-G4
XT-G5
XT-G6
XT-G7
XT-B0
XT-B1
XT-B2
XT-B3
XT-B4
XT-B5
XT-B6
XT-B7
XT-R0
XT-R1
XT-R2
XT-R4
XT-R5
XT-R6
XT-R7
DA-LOAD*
DA-DATA*
DA-CLK*
EX-ALSYNC*
XT-CCDKILL*
EX-HSYNC*
AUX-PORT1*
EX-VCLK*
R2505
0 2A
< to IP >
< from IP >
ANAPRO -> CCD
J2503
+12V
RGV2
+5V
EX-CP*
EX-R*
EX-FTG*
EX-F1*
EX-F2*
CCD -> ANAPRO
J2501
EX-W1ODD
EX-W1EVEN
EX-W2ODD
EX-W2EVEN
EX-W3ODD
EX-W3EVEN
<RED ODD>
<RED EVEN>
<GREEN ODD>
<GREEN EVEN>
<BLUE ODD>
<BLUE EVEN>
POWER -> ANAPRO
J2534
RGV1
RGV2
RGV3
RGV4
-15V
+8V
-8V
+5V
C2503
C2504
C2505
C2501

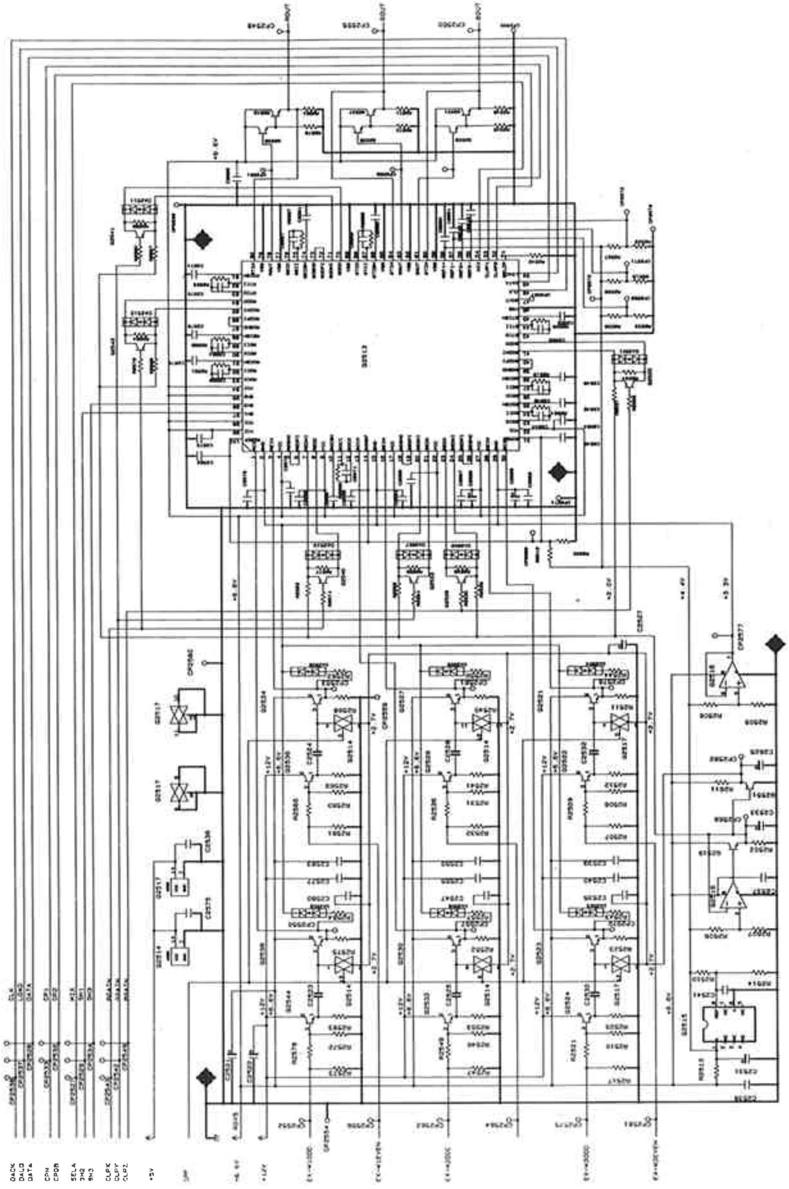
Analog processor circuit diagram (2/5)


+5V
R2602
CCDKILL*
R2604
Q2549
R2603
Q2502
GND
Vo
Vin
1
2
3
4
5
CP2503
+12V
CP2512
+15V
RGV1
D2501
C2622
C2502
CP2502
C2506
C2621
GND
D2502
Q2503
CP2516
+8V
RGV2
CP2518
+5V
C2507
C2619
C2509
D2503
Q2504
CP2521
FU2501
NF
RGV5
+6.6V
C2511
R2601
R2599
C2613
C2510
R2598

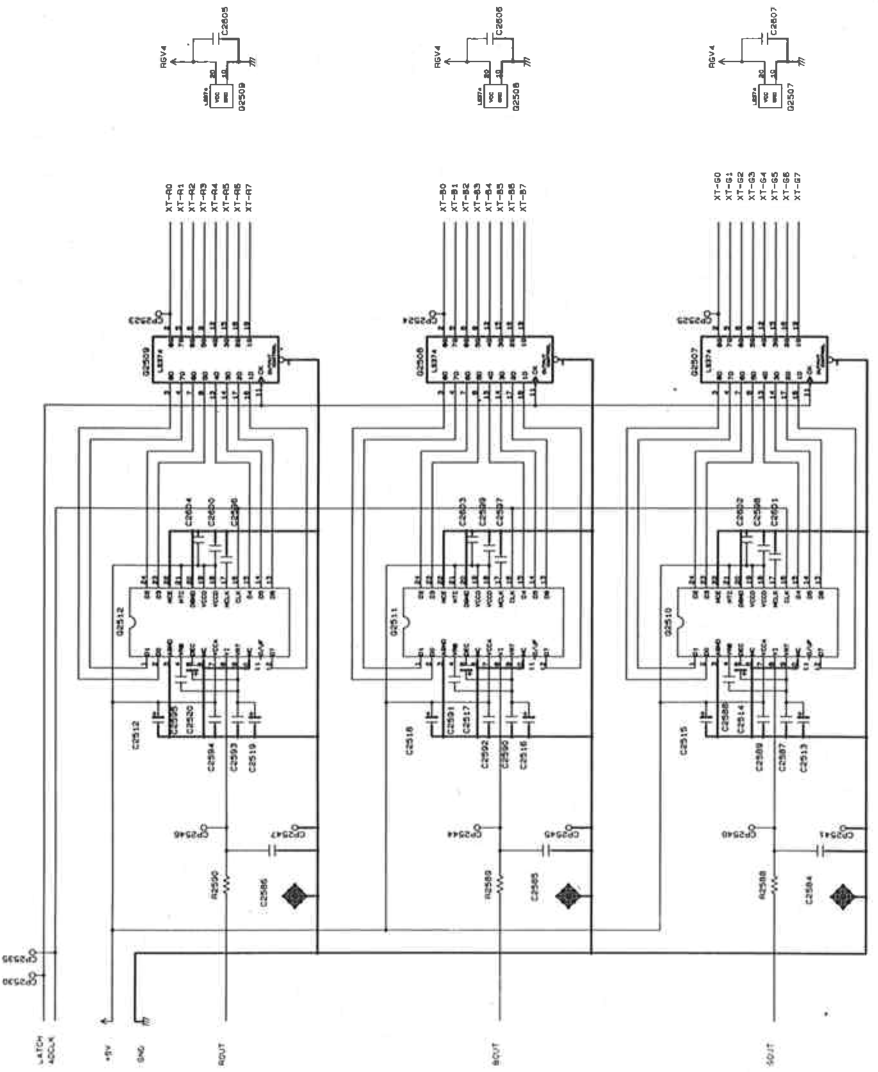
Analog processor circuit diagram (3/5)


CCDKILL*
CPF
DACK
DALD
DATA
CPN
CPOB
SELA
SH2
SH3
CLPX
CLPY
CLPZ
LATCH
ADCLK
Q2505
C2609
C2610
C2612
C2614
C2615
CP2519
CP2515
C2616
C2618
CP2513
CP2514
R2537
X2501
C2620
CP2510
CP2517
Q2501
Q2502
Q2503
Q2504
+8.0V
C2611
C2624
C2623
Q2506
DIGITAL +5V
RA2501
CP2501
CP2508
CP2507
CP2511
CP2504
CP2505
CP2509
CP2530
CP2531
CP2522
XT-CCDKILL*
EX-ALSYNC*
DA-LOAD*
DA-CLK*
DA-DATA*
EX-VCLK*
EX-HSYNC*
GND
EX-DF*
EX-R*
EX-FTG*
EX-F1*
EX-F2*

Analog processor circuit diagram (4/5)

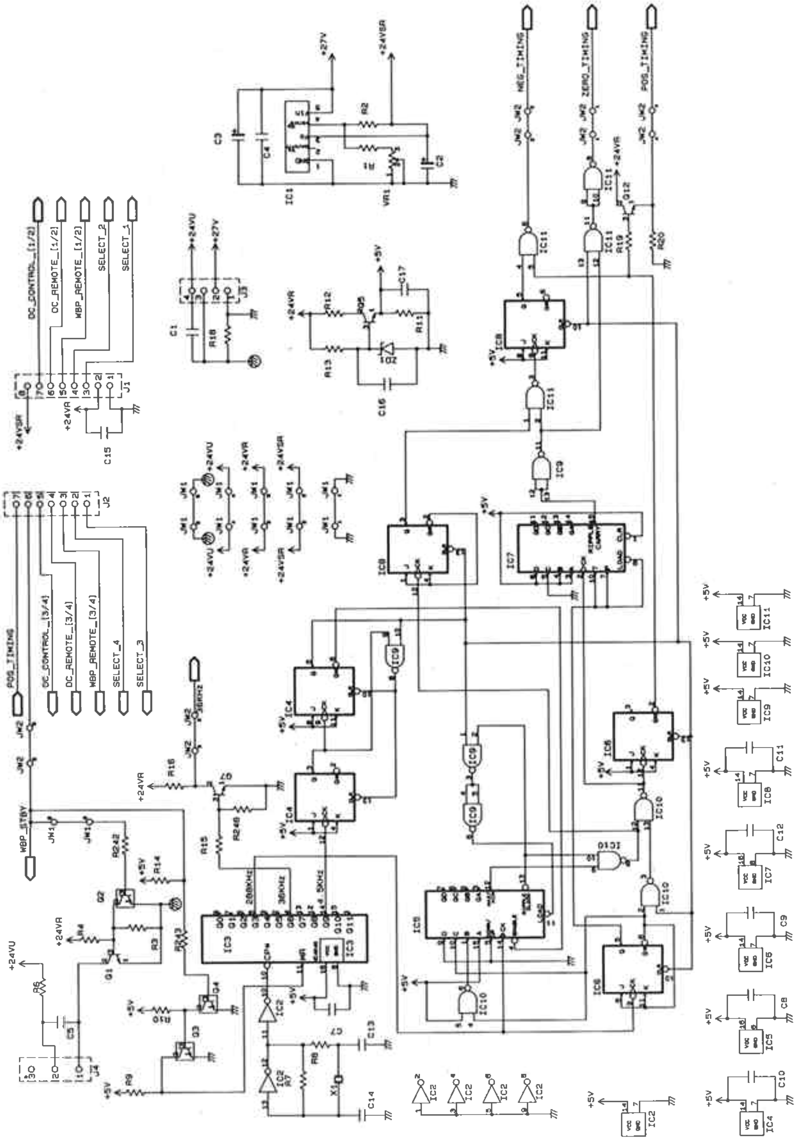

ROUT
GOUT
BOUT
DACK
DALD
DATA
CPN
CPDB
SELA
SH2
SH3
CLPX
CLPY
CLPZ
+5V
+12V

Analog processor circuit diagram (5/5)

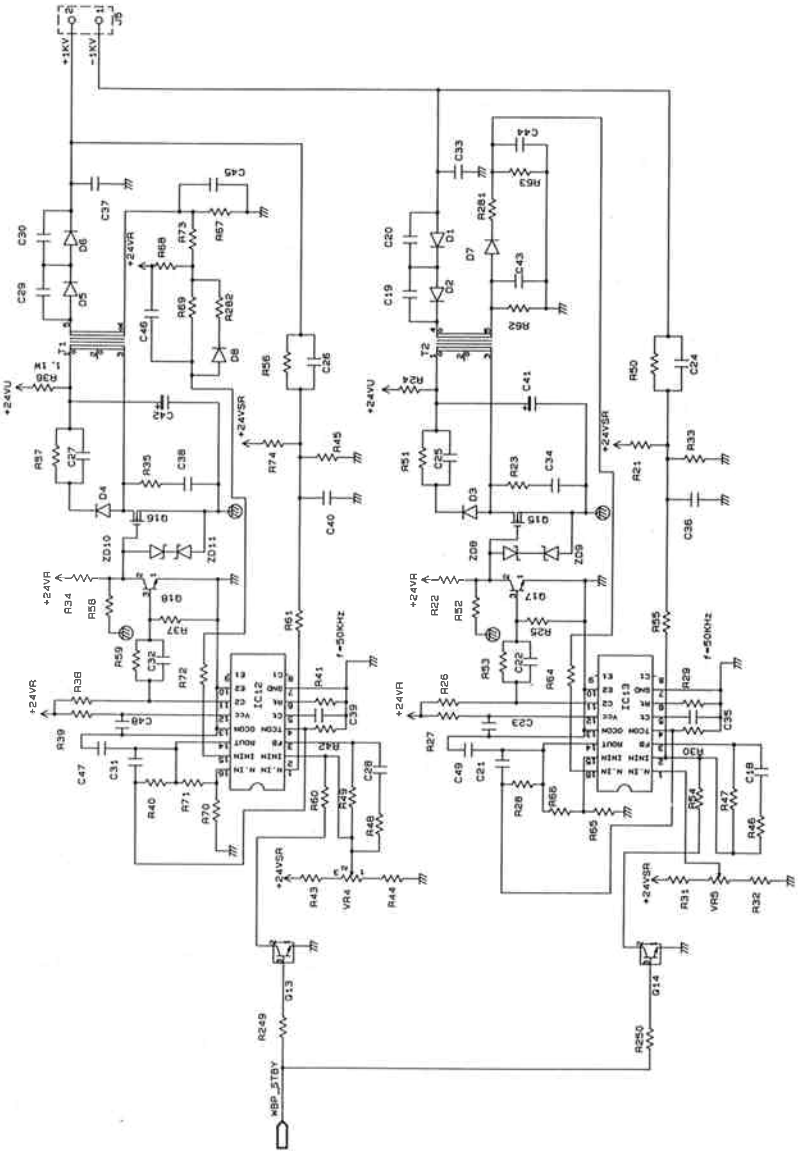

RGV4
C2505
C2506
C2507
G2509
G2508
G2507
LS374
XT-R0
XT-R1
XT-R2
XT-R3
XT-R4
XT-R5
XT-R6
XT-R7
XT-B0
XT-B1
XT-B2
XT-B3
XT-B4
XT-B5
XT-B6
XT-B7
XT-G0
XT-G1
XT-G2
XT-G3
XT-G4
XT-G5
XT-G6
XT-G7
CP2523
CP2524
CP2525
G2512
G2511
G2510
C2604
C2600
C2596
C2603
C2599
C2597
C2602
C2598
C2601
C2512
C2595
C2520
C2594
C2593
C2519
C2518
C2591
C2517
C2592
C2590
C2516
C2515
C2589
C2514
C2588
C2587
C2513
CP2546
CP2547
CP2544
CP2545
CP2540
CP2541
R2590
C2586
R2589
C2585
R2588
C2584
CP2535
CP2530
LATCH
ADCLK
+5V
GND
ROUT
BOUT
GOUT

H. DEVELOPING BIAS CIRCUIT DIAGRAM

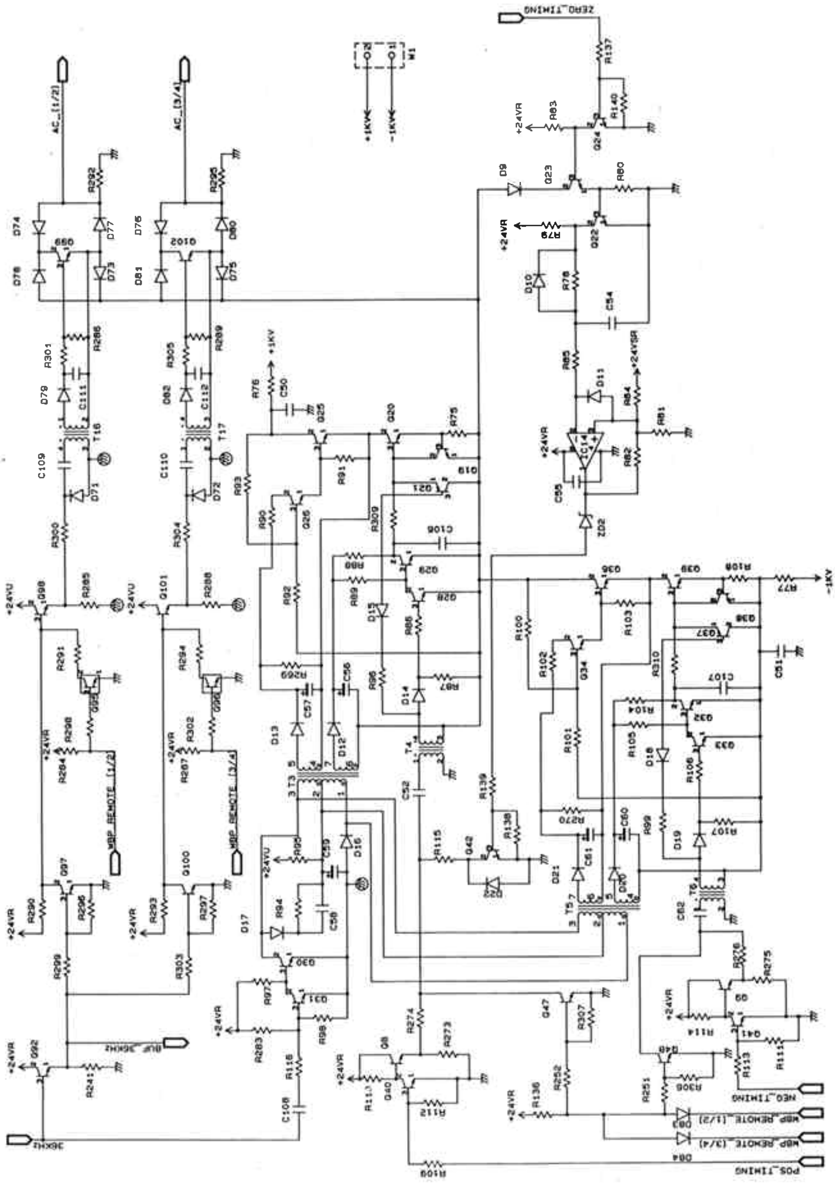
Developing bias circuit diagram (1/6)


NEG_TIMING
ZERO_TIMING
POS_TIMING
+27V
+24VSR
+24VR
+24VU
+5V
IC1
VR1
R1
R2
C2
C3
C4
DC_CONTROL_[1/2]
DC_REMOTE_[1/2]
WBP_REMOTE_[1/2]
SELECT_2
SELECT_1
J1
J2
J3
J4
C15
DC_CONTROL_[3/4]
DC_REMOTE_[3/4]
WBP_REMOTE_[3/4]
SELECT_4
SELECT_3
WBP_STBY
JW1
JW2
38KHz
208KHz
14.5KHz
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
X1
Q1
Q2
Q3
Q4
Q5
Q12
D2
C1
C5
C7
C8
C9
C10
C11
C12
C13
C14
C16
C17
R3
R4
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R18
R19
R20
R242
R243
R246
VCC
GND

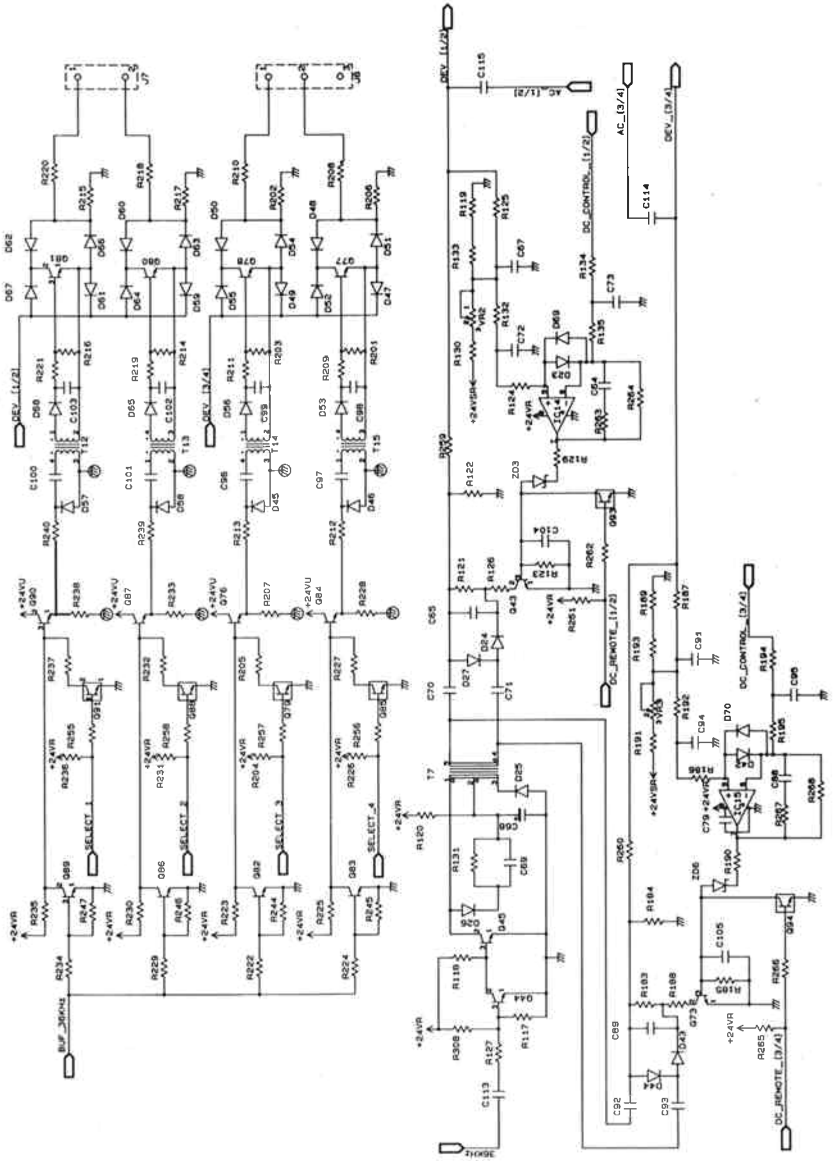
Developing bias circuit diagram (2/6)


J5
+1KV
-1KV
C30
C29
D6
D5
C37
+24VR
R68
R73
R57
C45
R69
R282
C46
D8
T1
R36 1, 1W
+24VU
C42
+24VSR
R56
C26
R57
C27
R35
C38
R74
R45
D4
Q16
C40
ZD10
ZD11
+24VR
R34
R58
Q18
R37
R61
f=50KHz
R59
C32
R72
R38
+24VR
IC12
R41
C48
C39
R39
C47
C31
R42
C28
R40
R71
R70
R60
R49
R48
+24VSR
R43
VR4
R44
Q13
R249
WBP_STBY
C20
C19
D1
D2
R281
D7
C33
C44
R63
C43
R62
T2
R24
+24VU
C41
+24VSR
R50
C24
R51
C25
R23
C34
R21
R33
D3
Q15
C36
ZD8
ZD9
+24VR
R22
R52
Q17
R25
R55
f=50KHz
R53
C22
R64
R26
+24VR
IC13
R29
C23
C35
R27
C49
C21
R30
C18
R28
R66
R65
R54
R47
R46
+24VSR
R31
VR5
R32
Q14
R250

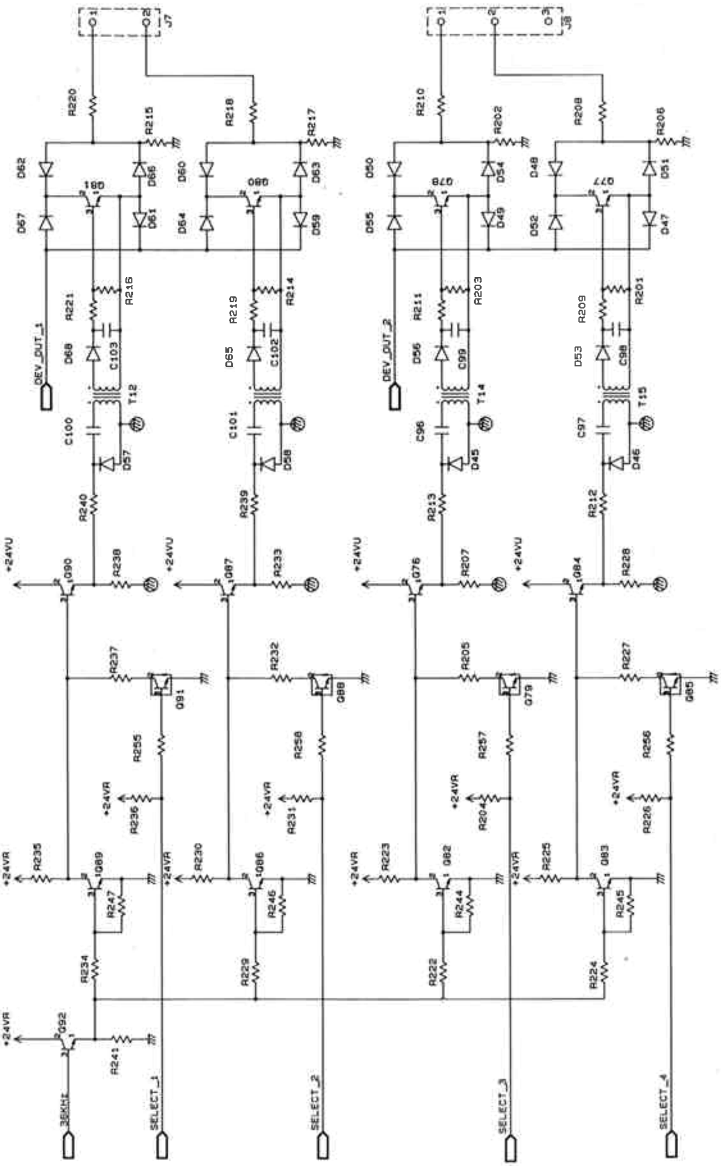
Developing bias circuit diagram (3/6)


AC_(1/2)
AC_(3/4)
ZERO_TIMING
+1KV
-1KV
W1
+24VR
+24VU
+24VSR
-1KV
36KHz
BUF 36KHz
WBP_REMOTE_(1/2)
WBP_REMOTE_(3/4)
NEG_TIMING
POS_TIMING
IC14
T3
T4
T5
T6
T16
T17

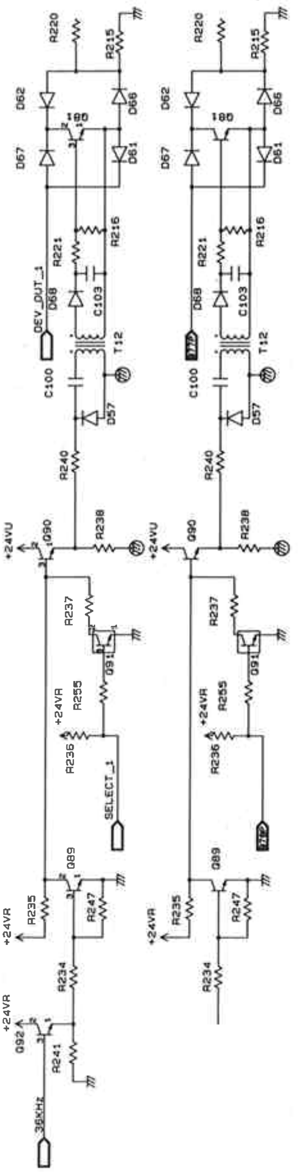
Developing bias circuit diagram (4/6)


J7
J8
DEV_(1/2)
DEV_(3/4)
AC_(1/2)
AC_(3/4)
DC_CONTROL_(1/2)
DC_CONTROL_(3/4)
DC_REMOTE_(1/2)
DC_REMOTE_(3/4)
BUF_36KHz
36KHz
SELECT_1
SELECT_2
SELECT_3
SELECT_4
+24VR
+24VU
+24VSR
T7
T12
T13
T14
T15
IC14
IC15
VR2
VR3
C115
C114
C113

Developing bias circuit diagram (5/6)

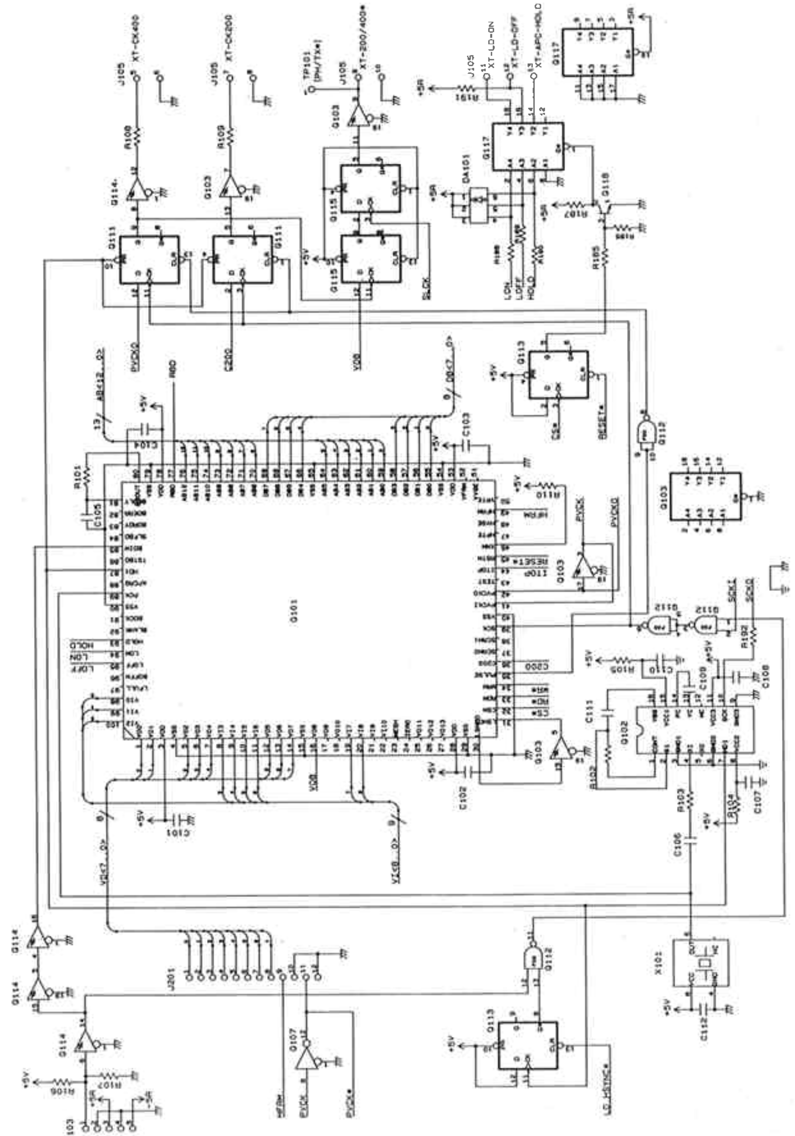

J7
J8
DEV_OUT_1
DEV_OUT_2
36KHz
SELECT_1
SELECT_2
SELECT_3
SELECT_4
+24VU
+24VR
T12
T14
T15
Q76
Q77
Q78
Q79
Q80
Q81
Q82
Q83
Q84
Q85
Q86
Q87
Q88
Q89
Q90
Q91
Q92
C96
C97
C98
C99
C100
C101
C102
C103
R201
R202
R203
R204
R205
R206
R207
R208
R209
R210
R211
R212
R213
R214
R215
R216
R217
R218
R219
R220
R221
R222
R223
R224
R225
R226
R227
R228
R229
R230
R231
R232
R233
R234
R235
R236
R237
R238
R239
R240
R241
R244
R245
R246
R247
R255
R256
R257
R258
D45
D46
D47
D48
D49
D50
D51
D52
D53
D54
D55
D56
D57
D58
D59
D60
D61
D62
D63
D64
D65
D66
D67
D68

Developing bias circuit diagram (6/6)

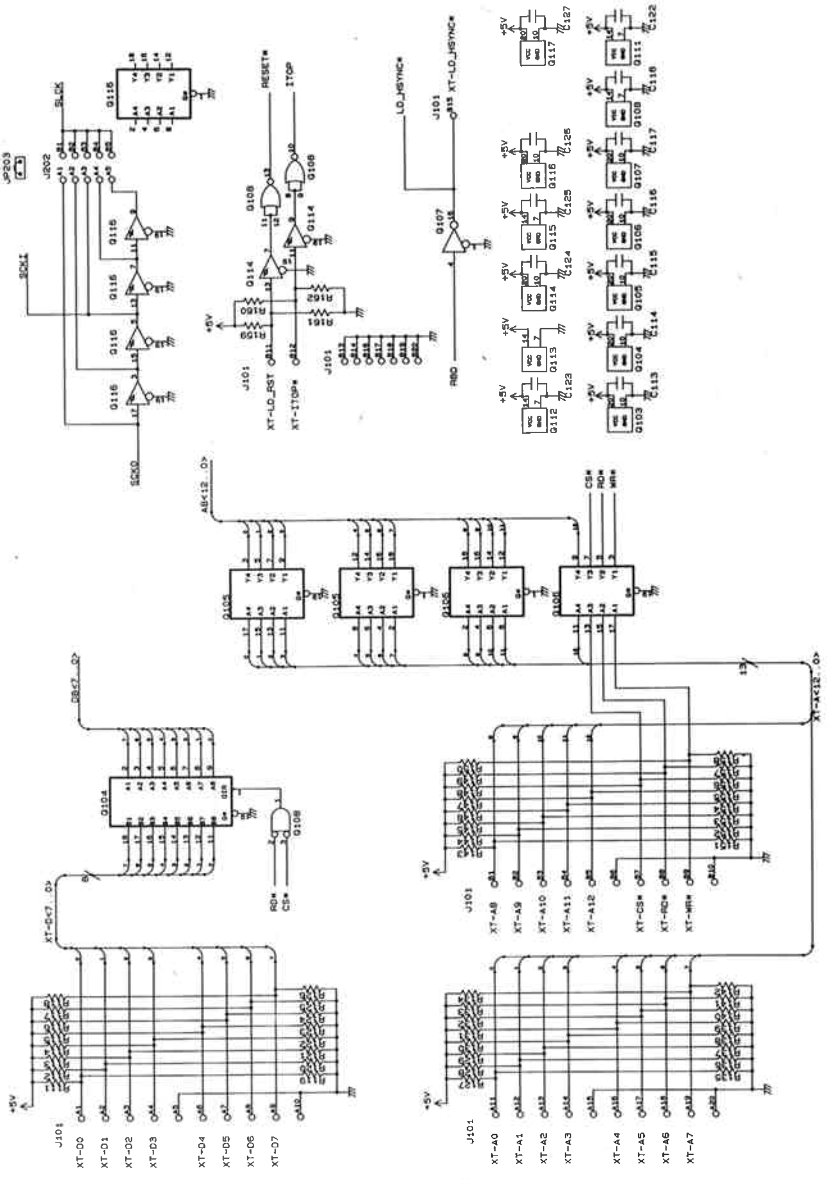

R220
R215
D62
D66
Q80
D67
D61
R221
R216
DEV_OUT_1
D68
C103
T12
C100
D57
R240
+24VU
Q90
R238
R237
Q91
+24VR
R255
R236
SELECT_1
Q89
R235
R247
R234
Q92
R241
36KHz

I. LASER CONTROLLER CIRCUIT DIAGRAM

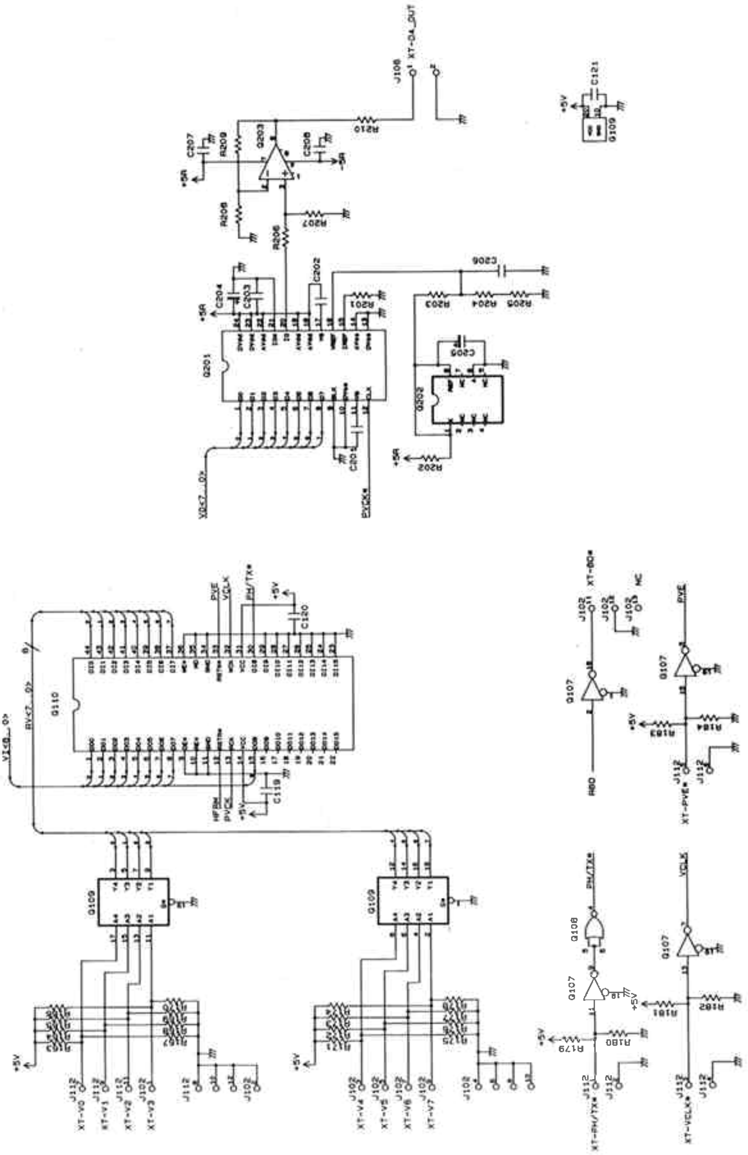
Laser controller circuit diagram (1/4)


J105
XT-CK400
XT-CK200
TP101
XT-200/400*
XT-LD-ON
XT-LD-OFF
XT-APC-HOLD
Q117
Q111
Q114
Q103
Q115
Q113
Q112
Q116
Q118
DA101
Q101
Q102
Q107
X101
J201
J103
PVCK0
C200
V08
SLCK
LON
LOFF
HOLD
RESET*
VI<8..0>
VI<7..0>
AB<12..0>
DB<7..0>
LD_HSYNC*
PVCK*
SCK1
SCK0
C101
C102
C103
C104
C105
C106
C107
C108
C109
C110
C111
C112
R101
R102
R103
R104
R105
R106
R107
R108
R109
+5V
+5R

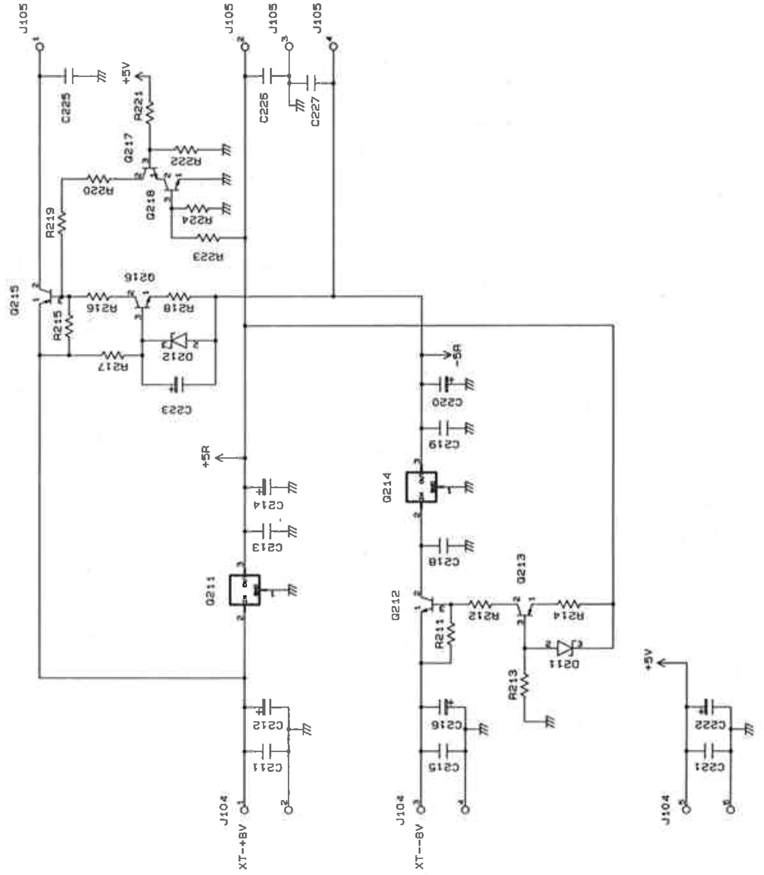
Laser controller circuit diagram (2/4)


JP203
J202
SLCK
SCK1
SCK0
Q116
Q115
Q114
Q108
Q107
RESET*
ITOP
LD_HSYNC*
XT-LD_HSYNC*
J101
XT-LD_RST
XT-ITOP*
R159
R160
R161
R162
RBD
+5V
Q112
Q113
Q117
C123
C124
C125
C126
C127
Q103
Q104
Q105
Q106
Q107
Q108
Q111
C113
C114
C115
C116
C117
C118
C122
AB<12..0>
CS*
RD*
WR*
DB<7..0>
XT-D<7..0>
XT-A<12..0>
RD*
CS*
XT-D0
XT-D1
XT-D2
XT-D3
XT-D4
XT-D5
XT-D6
XT-D7
XT-A0
XT-A1
XT-A2
XT-A3
XT-A4
XT-A5
XT-A6
XT-A7
XT-A8
XT-A9
XT-A10
XT-A11
XT-A12
XT-CS*
XT-RD*
XT-WR*

Laser controller circuit diagram (3/4)

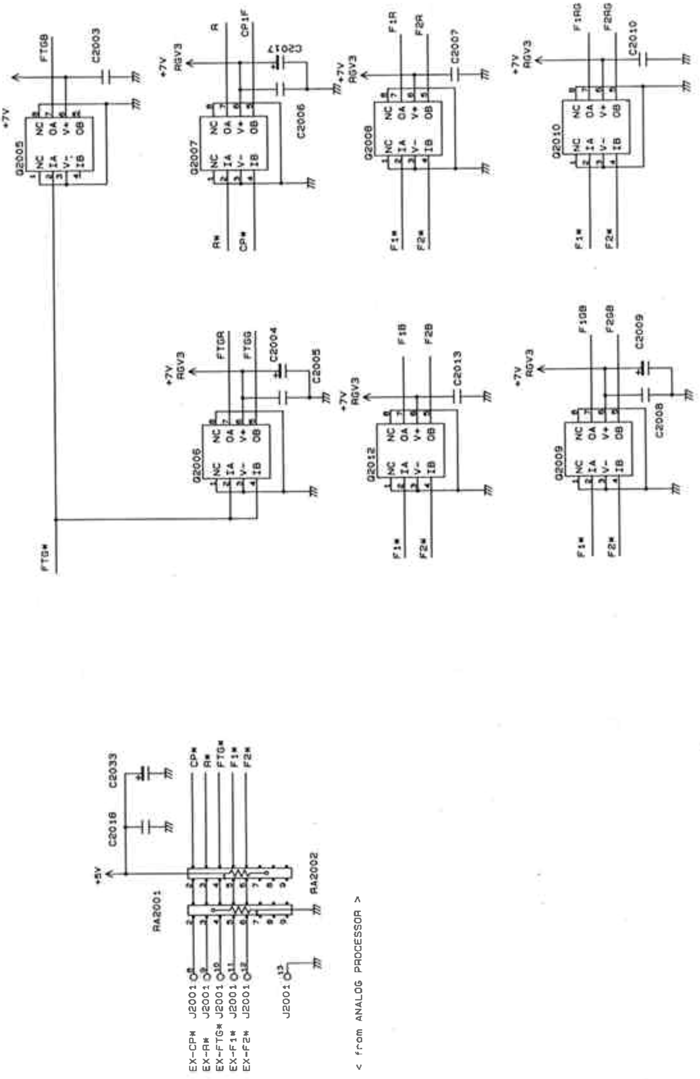

J106
XT-DA_OUT
R210
Q203
C207
R209
C208
R208
R207
R206
+5R
-5R
Q201
C204
C203
C202
R201
C206
R203
R204
R205
C205
Q202
R202
C201
VD<7...0>
PVCK*
+5V
C121
Q109
Q110
VI<8...0>
RV<7...0>
PVE
VCLK
PH/TX*
C120
C119
HPSM
PVCK
Q109
Q107
Q108
XT-BD*
NC
BDO
R183
R184
XT-PVE*
R179
R180
R181
R182
XT-PH/TX*
XT-VCLK*
J112
J102
XT-V0
XT-V1
XT-V2
XT-V3
XT-V4
XT-V5
XT-V6
XT-V7

Laser controller circuit diagram (4/4)

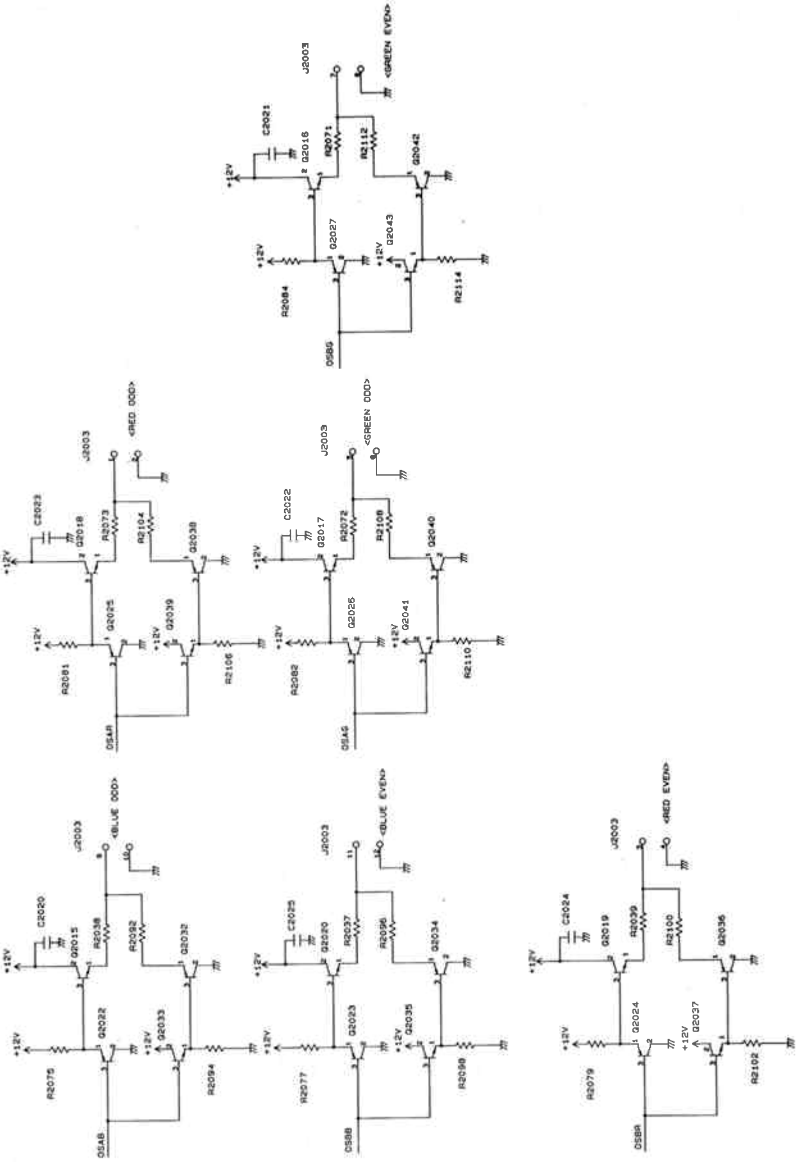

J105
C225
+5V
R221
Q217
R222
R220
Q218
R224
R223
R219
Q215
R215
R216
Q216
R218
D212
R217
C223
C226
C227
-5R
C220
C219
Q214
+5R
C214
C213
Q211
C218
Q212
Q213
R212
R214
R211
D211
R213
C212
C211
C216
C215
C222
C221
J104
XT-+8V
XT--8V

J. CCD/CCD DRIVER CIRCUIT DIAGRAM

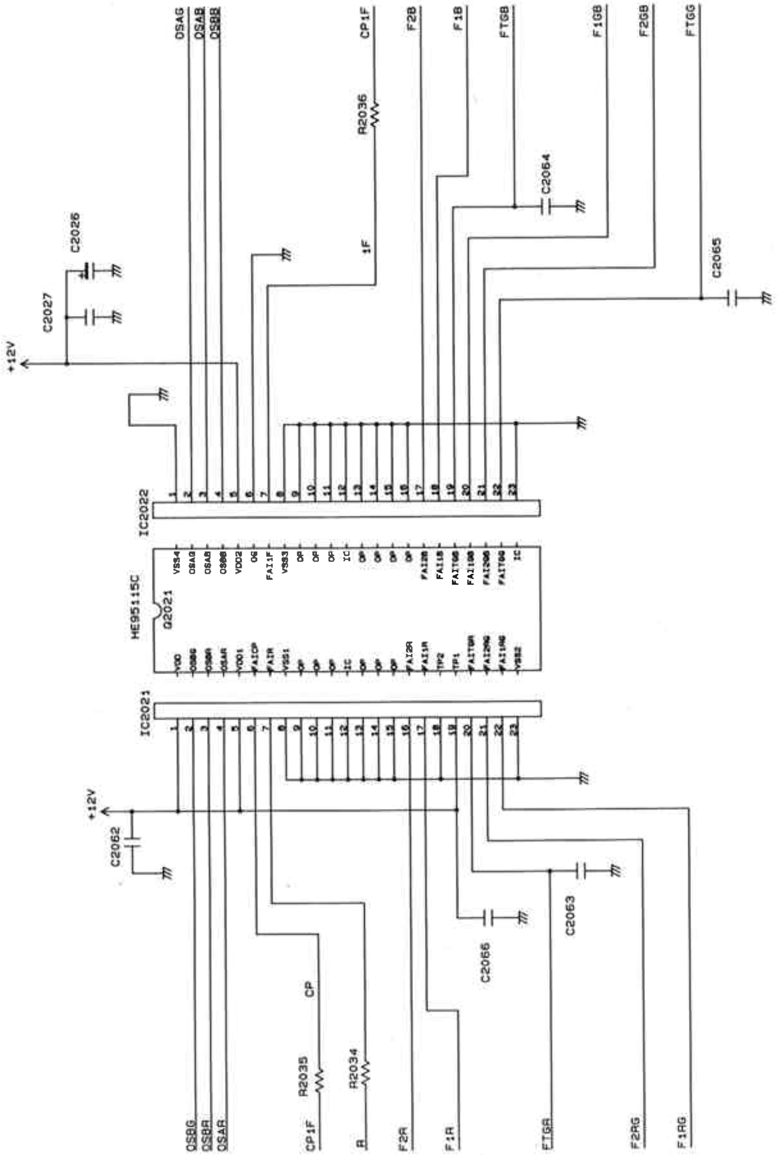
CCD/CCD driver circuit diagram (1/4)


Q2005
Q2007
Q2008
Q2010
Q2006
Q2012
Q2009
NC
IA
V-
IB
NC
OA
V+
OB
+7V
RGV3
FTGB
C2003
R
CP1F
C2017
C2006
F1R
F2R
C2007
F1RG
F2RG
C2010
R*
CP*
F1*
F2*
FTGR
FTGG
C2004
C2005
F1B
F2B
C2013
F1GB
F2GB
C2009
C2008
FTG*
C2033
C2018
+5V
RA2001
RA2002
CP*
R*
FTG*
F1*
F2*
EX-CP* J2001
EX-R* J2001
EX-FTG* J2001
EX-F1* J2001
EX-F2* J2001
J2001
< from ANALOG PROCESSOR >

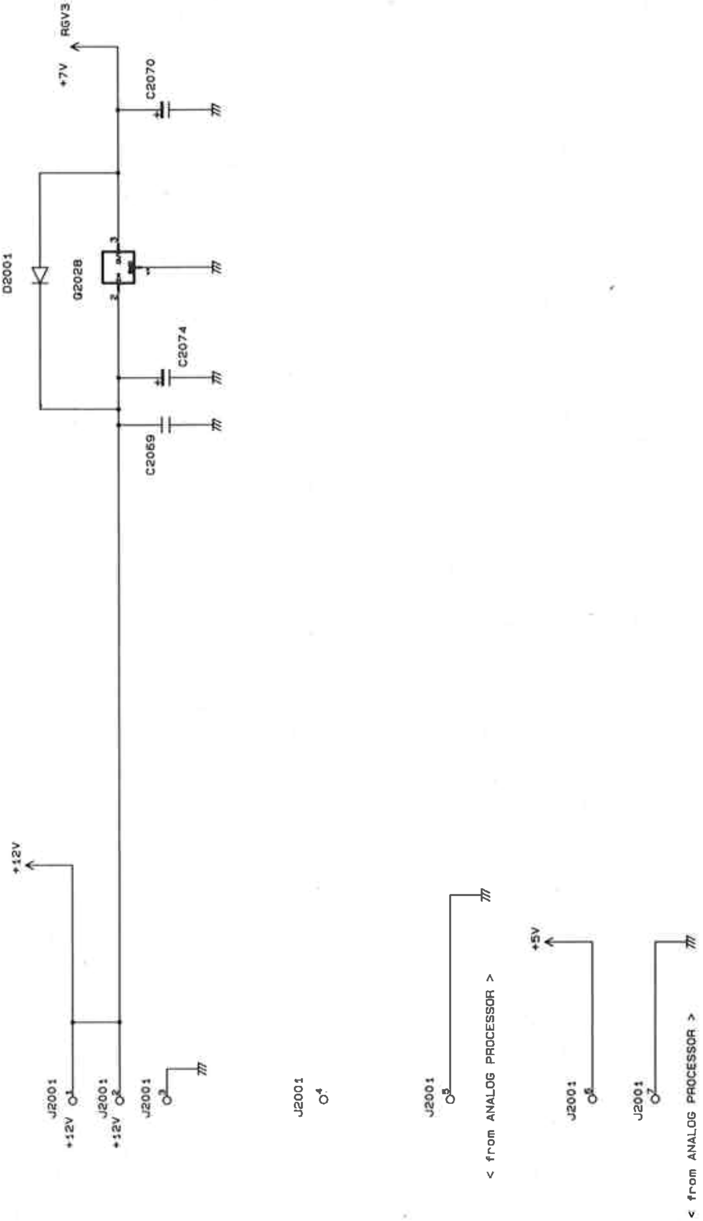
CCD/CCD driver circuit diagram (2/4)


J2003
<GREEN EVEN>
C2021
Q2016
R2071
R2112
Q2042
+12V
Q2027
Q2043
R2084
R2114
OSBG
J2003
<RED ODD>
C2023
Q2018
R2073
R2104
Q2038
Q2025
Q2039
R2081
R2106
OSAR
J2003
<GREEN ODD>
C2022
Q2017
R2072
R2108
Q2040
Q2026
Q2041
R2082
R2110
OSAG
J2003
<BLUE ODD>
C2020
Q2015
R2038
R2092
Q2032
Q2022
Q2033
R2075
R2094
OSAB
J2003
<BLUE EVEN>
C2025
Q2020
R2037
R2096
Q2034
Q2023
Q2035
R2077
R2098
OSBB
J2003
<RED EVEN>
C2024
Q2019
R2039
R2100
Q2036
Q2024
Q2037
R2079
R2102
OSBR

CCD/CCD driver circuit diagram (3/4)

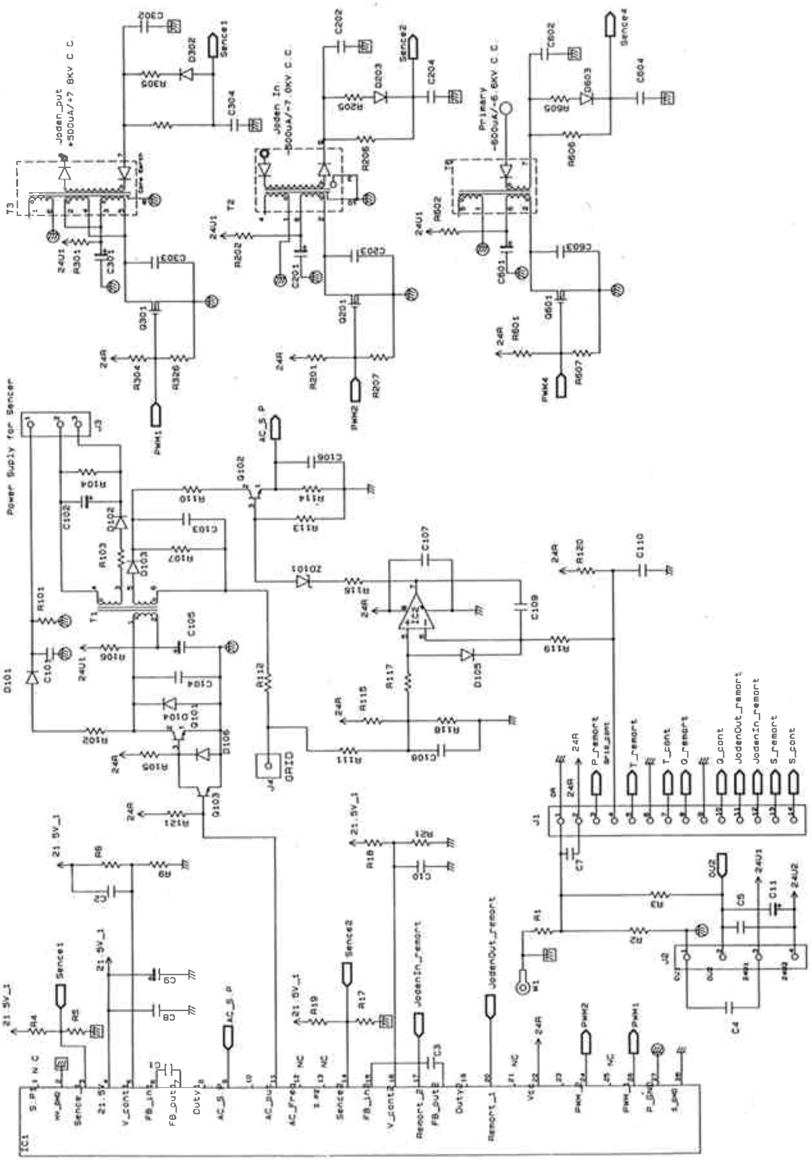

OSAG
OSAB
OSBB
CP1F
F2B
F1B
FTGB
F1GB
F2GB
FTGG
R2036
C2064
C2026
C2027
+12V
1F
C2065
IC2022
HE95115C
Q2021
IC2021
VSS4
OSAG
OSAB
OSBB
VDD2
OG
FAI1F
VSS3
OP
IC
FAI2B
FAI1B
FAITGB
FAI1GB
FAI2GB
FAITGG
VDD
OSBG
OSBR
OSAR
VDD1
FAICP
FAIR
VSS1
FAI2R
FAI1R
TP2
TP1
FAITGR
FAI2RG
FAI1RG
VSS2
+12V
C2062
C2066
C2063
CP
R2035
R2034
OSBG
OSBR
OSAR
CP1F
R
F2R
F1R
FTGR
F2RG
F1RG

CCD/CCD driver circuit diagram (4/4)

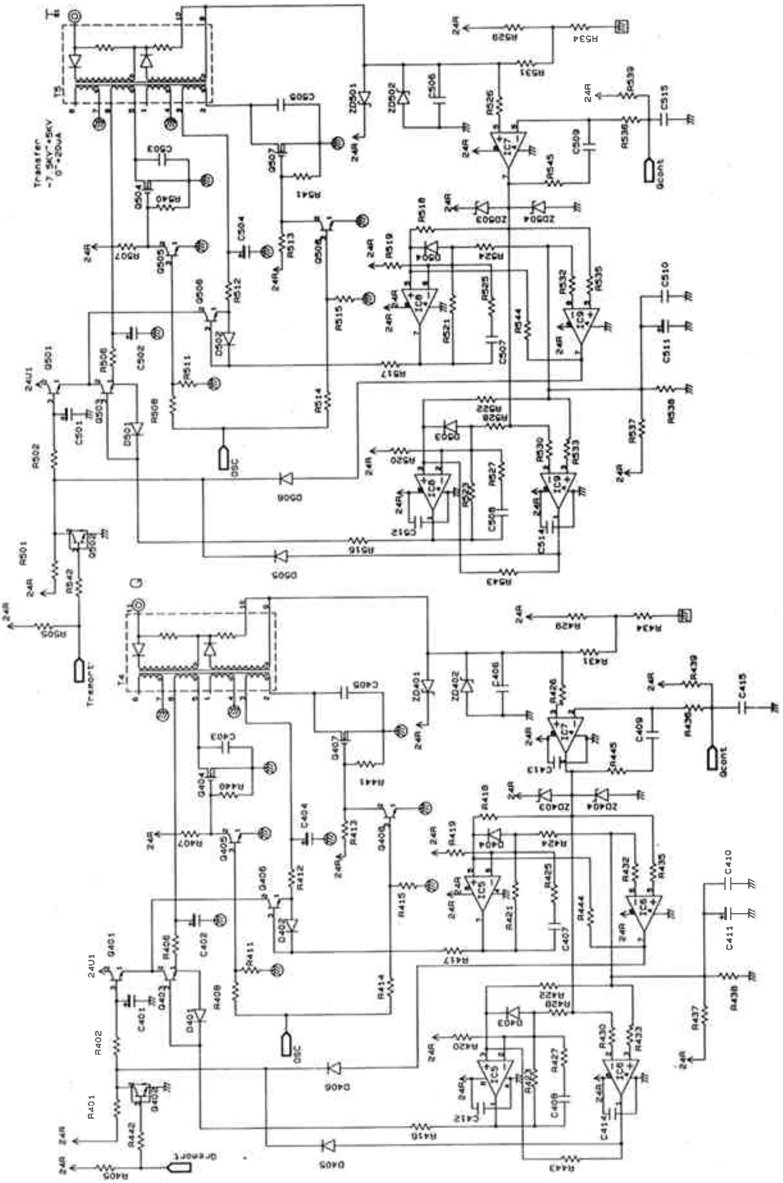

RGV3
+7V
C2070
D2001
Q2028
C2074
C2069
+12V
J2001 1 +12V
J2001 2 +12V
J2001 3
J2001 4
J2001 5
< from ANALOG PROCESSOR >
+5V
J2001 6
J2001 7
< from ANALOG PROCESSOR >

K. HVT CIRCUIT DIAGRAM

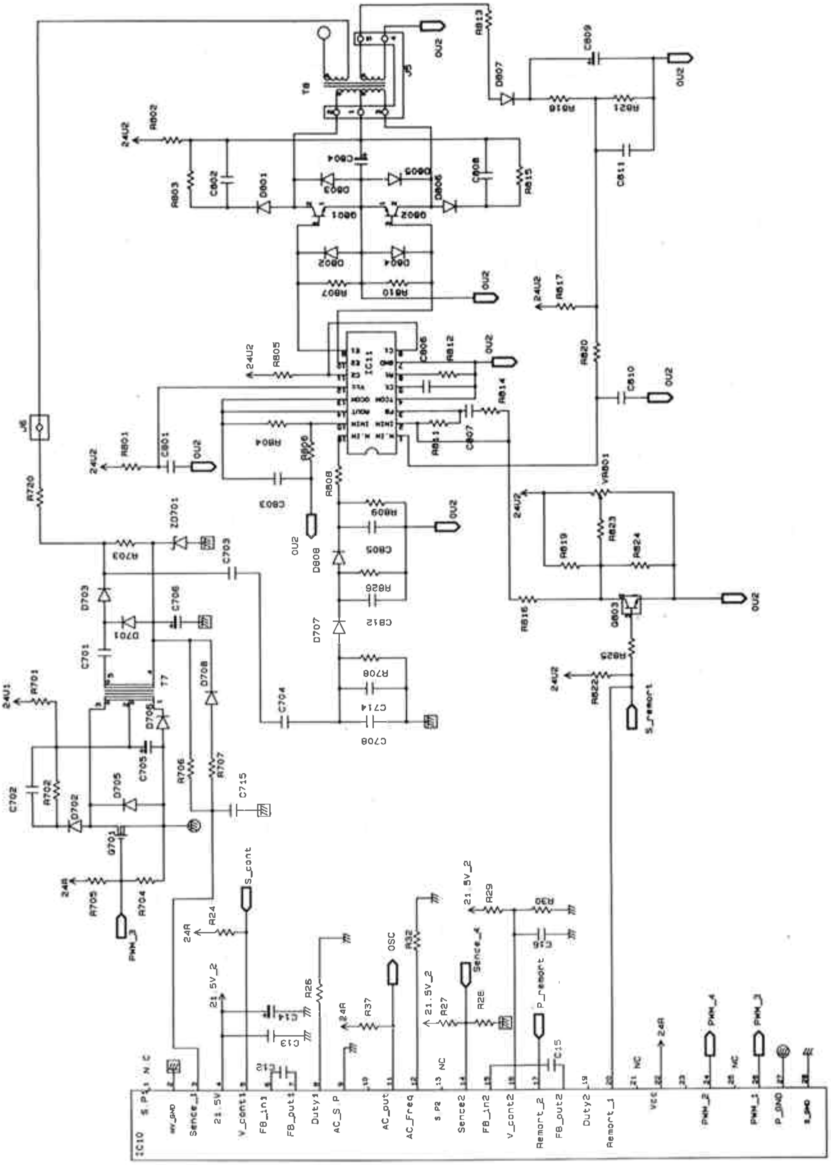
HVT circuit diagram (1/3)


Joden_put +500uA/+7.8kV C.C.
Joden In -500uA/-7.0kV C.C.
Primary -600uA/-6.6kV C.C.
Sence1
Sence2
Sence4
T3
T2
T6
T1
Q301
Q201
Q601
Q102
Q103
PWM1
PWM2
PWM4
24A
24U1
AC_S_P
Power Suply for Sencer
J3
J4
GRID
IC2
J1
0A
P_remort
Grid_cont
T_remort
T_cont
Q_remort
Q_cont
JodenOut_remort
JodenIn_remort
S_remort
S_cont
J2
OU2
24U2
21.5V_1
IC1
S_P1
HV_GND
Sence_1
21.5V
V_cont
FB_in
FB_out
Duty
AC_S_P
AC_out
AC_Fre
S_P2
Sence2
FB_in2
V_cont2
Remort_2
FB_out2
Duty2
Remort_1
Vt
PWM_2
PWM_1
P_GND
S_GND
N.C
NC

HVT circuit diagram (2/3)

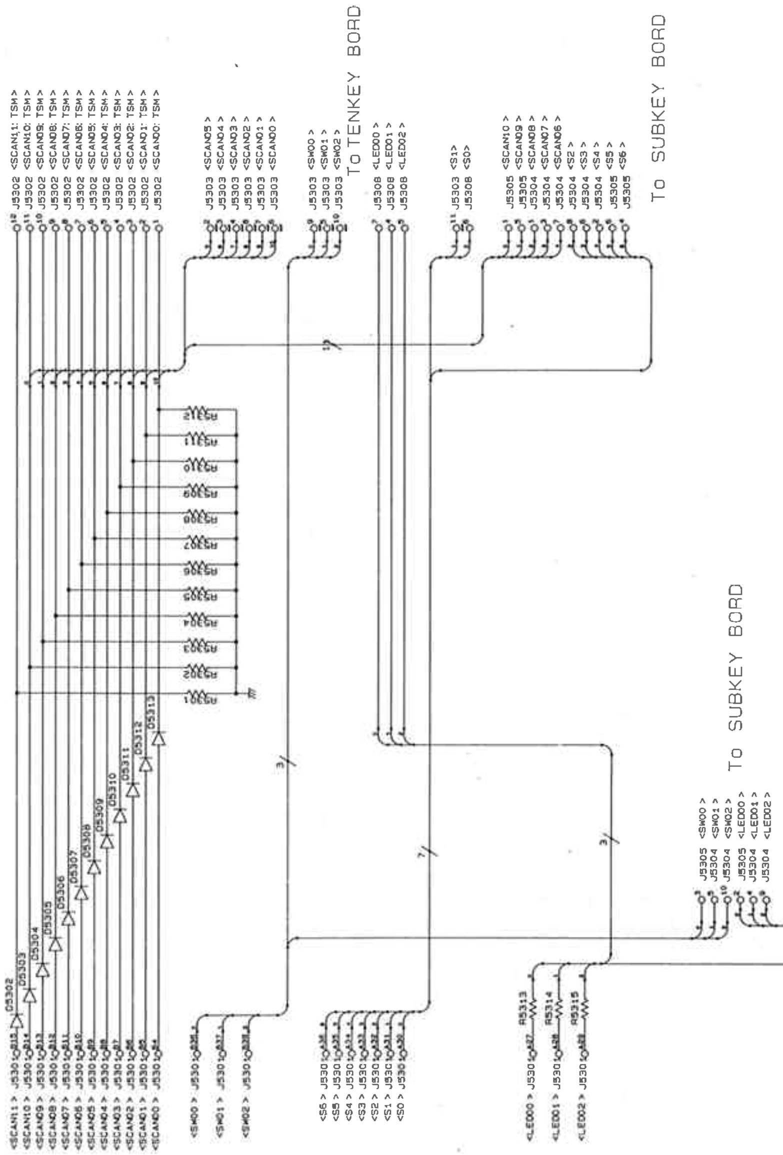

Transfer
-7.5KV~+5KV
0~+20uA
T5
T4
Tranport
Qcont
OSC
24R
24U1
Q501
Q503
Q504
Q505
Q506
Q507
Q508
Q401
Q403
Q404
Q405
Q406
Q407
Q408
IC5
IC6
IC7
IC8
IC9
ZD501
ZD502
ZD503
ZD504
ZD401
ZD402
ZD403
ZD404
D501
D502
D503
D504
D505
D506
D401
D402
D403
D404
D405
D406
C501
C502
C503
C504
C505
C506
C507
C508
C509
C510
C511
C512
C514
C515
C401
C402
C403
C404
C405
C406
C407
C408
C409
C410
C411
C412
C413
C414
C415
R501
R502
R505
R506
R507
R508
R511
R512
R513
R514
R515
R516
R517
R518
R519
R520
R521
R522
R523
R524
R525
R526
R527
R528
R529
R530
R531
R532
R533
R534
R535
R536
R537
R538
R539
R540
R541
R542
R543
R544
R545
R401
R402
R405
R406
R407
R408
R411
R412
R413
R414
R415
R416
R417
R418
R419
R420
R421
R422
R423
R424
R425
R426
R427
R428
R429
R430
R431
R432
R433
R434
R435
R436
R437
R438
R439
R440
R441
R442
R443
R444
R445

HVT circuit diagram (3/3)

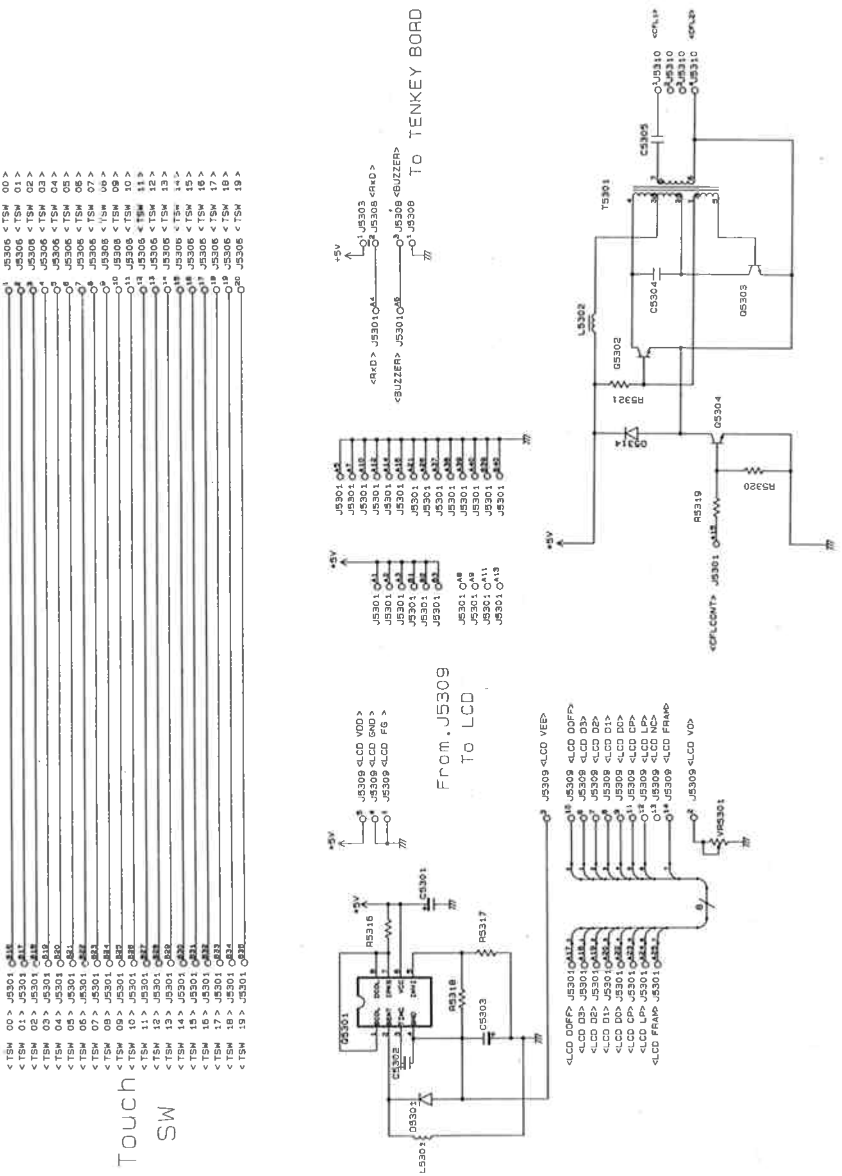

IC10
IC11
T6
T7
J5
J6
R720
R701
R702
R703
R704
R705
R706
R707
R708
C701
C702
C703
C704
C705
C706
C708
C714
C715
D701
D702
D703
D705
D706
D707
D708
ZD701
Q701
Q801
Q802
Q803
D801
D802
D803
D804
D805
D806
D807
D808
R801
R802
R803
R804
R805
R806
R807
R808
R809
R810
R811
R812
R813
R814
R815
R816
R817
R818
R819
R820
R821
R822
R823
R824
R825
R826
C801
C802
C803
C804
C805
C806
C807
C808
C809
C810
C811
C812
VR801
R24
R26
R27
R28
R29
R30
R32
R37
C13
C14
C15
C16
24U1
24U2
24R
OU2
21.5V_2
PWM_3
PWM_4
S_cont
S_remort
OSC
Sence_4
P_remort
S.P
NC
HV_GND
Sence_1
21.5V
V_cont1
FB_in1
FB_out1
Duty1
AC_S_P
AC_out
AC_Freq
S.P2
Sence2
FB_in2
V_cont2
Remort_2
FB_out2
Duty2
Remort_1
VCC
PWM_2
PWM_1
P_GND
S_GND

L. CONTROL PANEL RELAY CIRCUIT DIAGRAM

Control panel relay circuit diagram (1/2)

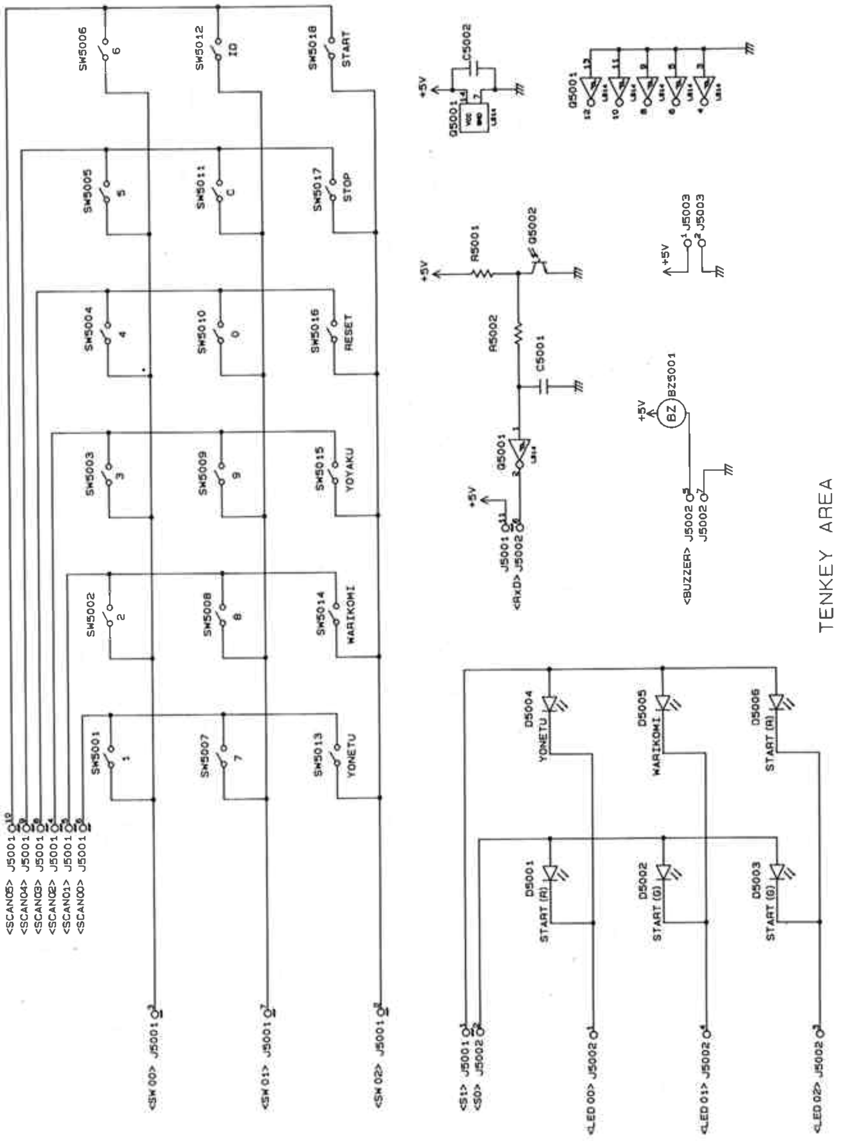

To TENKEY BORD
To SUBKEY BORD
To SUBKEY BORD
J5302 <SCAN11: TSM>
J5302 <SCAN10: TSM>
J5302 <SCAN09: TSM>
J5302 <SCAN08: TSM>
J5302 <SCAN07: TSM>
J5302 <SCAN06: TSM>
J5302 <SCAN05: TSM>
J5302 <SCAN04: TSM>
J5302 <SCAN03: TSM>
J5302 <SCAN02: TSM>
J5302 <SCAN01: TSM>
J5302 <SCAN00: TSM>
J5303 <SCAN05 >
J5303 <SCAN04 >
J5303 <SCAN03 >
J5303 <SCAN02 >
J5303 <SCAN01 >
J5303 <SCAN00 >
J5303 <SW00 >
J5303 <SW01 >
J5303 <SW02 >
J5308 <LED00 >
J5308 <LED01 >
J5308 <LED02 >
J5303 <S1>
J5308 <S0>
J5305 <SCAN10 >
J5305 <SCAN09 >
J5304 <SCAN08 >
J5304 <SCAN07 >
J5304 <SCAN06 >
J5304 <S2 >
J5304 <S3 >
J5304 <S4 >
J5305 <S5 >
J5305 <S6 >
12
3
7
3
R5301
R5302
R5303
R5304
R5305
R5306
R5307
R5308
R5309
R5310
R5311
R5312
D5302
D5303
D5304
D5305
D5306
D5307
D5308
D5309
D5310
D5311
D5312
D5313
R5313
R5314
R5315
<SCAN11 > J530
<SCAN10 > J530
<SCAN09 > J530
<SCAN08 > J530
<SCAN07 > J530
<SCAN06 > J530
<SCAN05 > J530
<SCAN04 > J530
<SCAN03 > J530
<SCAN02 > J530
<SCAN01 > J530
<SCAN00 > J530
<SW00 > J530
<SW01 > J530
<SW02 > J530
<S6 > J530
<S5 > J530
<S4 > J530
<S3 > J530
<S2 > J530
<S1 > J530
<S0 > J530
<LED00 > J530
<LED01 > J530
<LED02 > J530
J5305 <SW00 >
J5304 <SW01 >
J5304 <SW02 >
J5305 <LED00 >
J5304 <LED01 >
J5304 <LED02 >

Control panel relay circuit diagram (2/2)

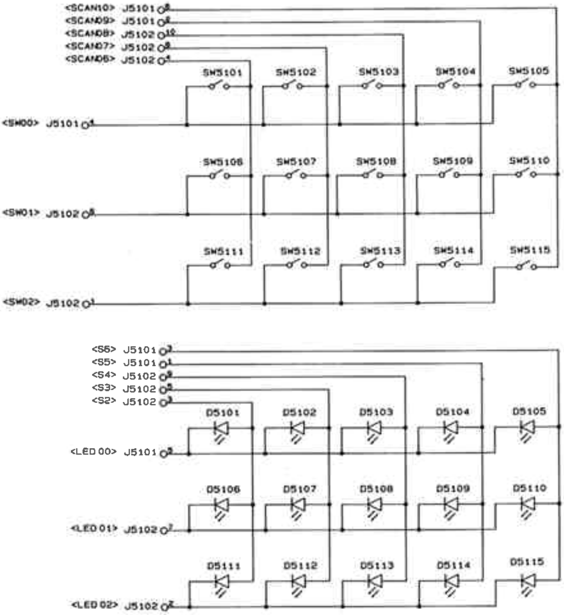

Touch SW
J5306 < TSW 00 >
J5306 < TSW 01 >
J5306 < TSW 02 >
J5306 < TSW 03 >
J5306 < TSW 04 >
J5306 < TSW 05 >
J5306 < TSW 06 >
J5306 < TSW 07 >
J5306 < TSW 08 >
J5306 < TSW 09 >
J5306 < TSW 10 >
J5306 < TSW 11 >
J5306 < TSW 12 >
J5306 < TSW 13 >
J5306 < TSW 14 >
J5306 < TSW 15 >
J5306 < TSW 16 >
J5306 < TSW 17 >
J5306 < TSW 18 >
J5306 < TSW 19 >
< TSW 00 > J5301
< TSW 01 > J5301
< TSW 02 > J5301
< TSW 03 > J5301
< TSW 04 > J5301
< TSW 05 > J5301
< TSW 06 > J5301
< TSW 07 > J5301
< TSW 08 > J5301
< TSW 09 > J5301
< TSW 10 > J5301
< TSW 11 > J5301
< TSW 12 > J5301
< TSW 13 > J5301
< TSW 14 > J5301
< TSW 15 > J5301
< TSW 16 > J5301
< TSW 17 > J5301
< TSW 18 > J5301
< TSW 19 > J5301
To TENKEY BORD
+5V
J5303
J5308 <RxD>
J5308 <BUZZER>
J5308
<RxD> J5301
<BUZZER> J5301
J5301
+5V
J5301
From. J5309
To LCD
+5V
J5309 <LCD VDD>
J5309 <LCD GND>
J5309 <LCD FG>
J5309 <LCD VEE>
J5309 <LCD DOFF>
J5309 <LCD D3>
J5309 <LCD D2>
J5309 <LCD D1>
J5309 <LCD D0>
J5309 <LCD CP>
J5309 <LCD LP>
J5309 <LCD NC>
J5309 <LCD FRAM>
J5309 <LCD V0>
VR5301
8
<LCD DOFF> J5301
<LCD D3> J5301
<LCD D2> J5301
<LCD D1> J5301
<LCD D0> J5301
<LCD CP> J5301
<LCD LP> J5301
<LCD FRAM> J5301
Q5301
R5316
C5301
R5317
R5318
C5303
C5302
D5301
L5301
T5301
C5305
J5310 <CFL1>
J5310
J5310
J5310 <CFL2>
C5304
Q5303
L5302
Q5302
R5321
D5314
Q5304
R5319
R5320
+5V
<CFLCONT> J5301

M. TENKEY CIRCUIT DIAGRAM

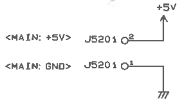
Tenkey circuit diagram (1/2)


SW5001 1
SW5002 2
SW5003 3
SW5004 4
SW5005 5
SW5006 6
SW5007 7
SW5008 8
SW5009 9
SW5010 0
SW5011 C
SW5012 ID
SW5013 YONETU
SW5014 WARIKOMI
SW5015 YOYAKU
SW5016 RESET
SW5017 STOP
SW5018 START
<SCAN05> J5001
<SCAN04> J5001
<SCAN03> J5001
<SCAN02> J5001
<SCAN01> J5001
<SCAN00> J5001
<SW 00> J5001
<SW 01> J5001
<SW 02> J5001
C5002
Q5001
+5V
R5001
Q5002
R5002
C5001
<RxD> J5001 J5002
J5003
BZ5001
BZ
<BUZZER> J5002
J5002
D5001 START (R)
D5002 START (G)
D5003 START (G)
D5004 YONETU
D5005 WARIKOMI
D5006 START (R)
<S1> J5001
<S0> J5002
<LED 00> J5002
<LED 01> J5002
<LED 02> J5002
TENKEY AREA

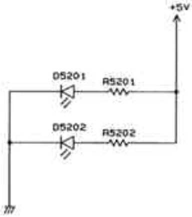
Tenkey circuit diagram (2/2)


<SCAN10> J5101
<SCAN09> J5101
<SCAN08> J5102 10
<SCAN07> J5102
<SCAN06> J5102
SW5101
SW5102
SW5103
SW5104
SW5105
<SW00> J5101
SW5106
SW5107
SW5108
SW5109
SW5110
<SW01> J5102
SW5111
SW5112
SW5113
SW5114
SW5115
<SW02> J5102 1
<S6> J5101
<S5> J5101 1
<S4> J5102
<S3> J5102
<S2> J5102
D5101
D5102
D5103
D5104
D5105
<LED 00> J5101
D5106
D5107
D5108
D5109
D5110
<LED 01> J5102
D5111
D5112
D5113
D5114
D5115
<LED 02> J5102

SUBKEY AREA

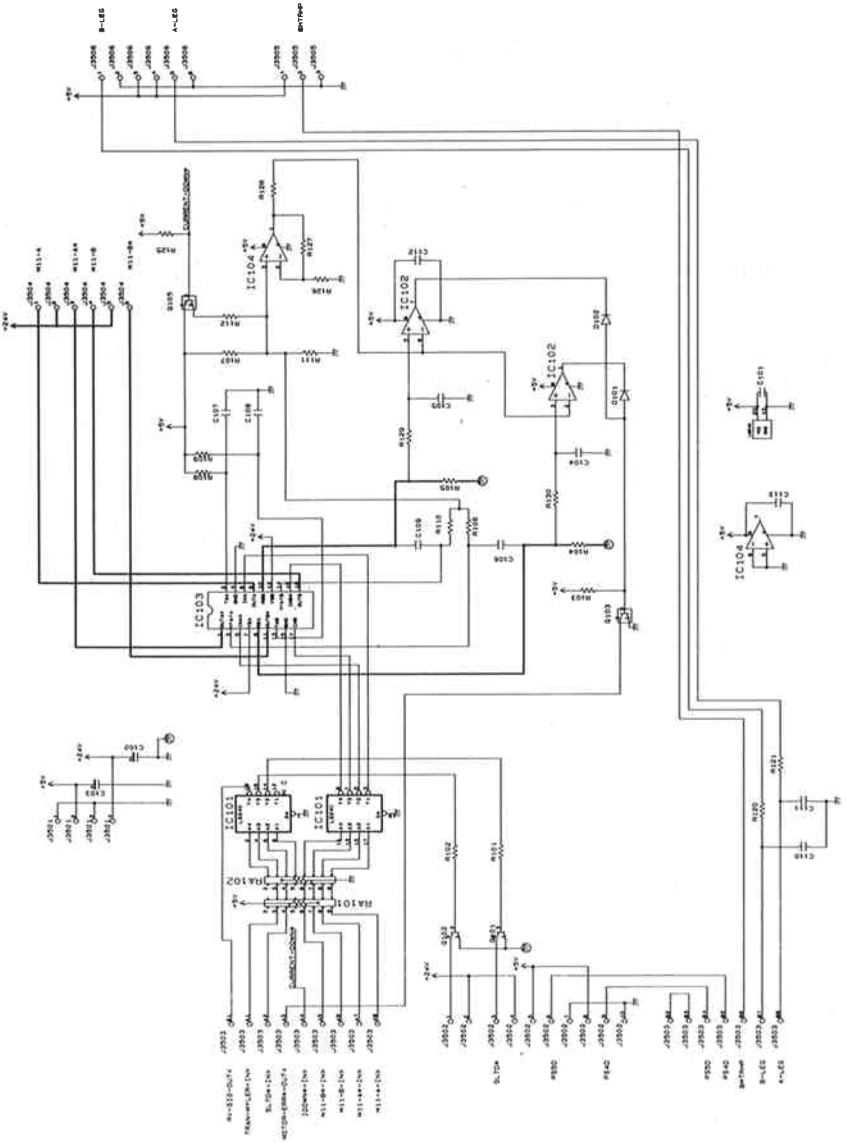

+5V
<MAIN: +5V> J5201 2
<MAIN: GND> J5201 1

From Ten Key SW Board

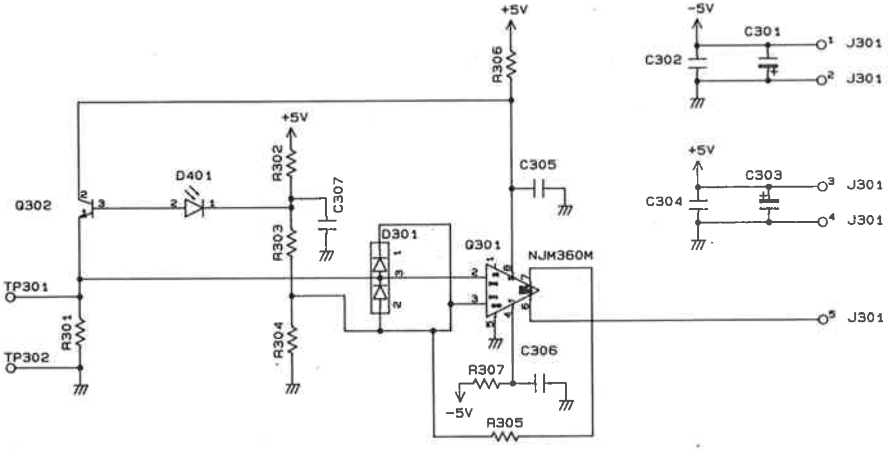

+5V
D5201
R5201
D5202
R5202

PILOT LAMP AREA

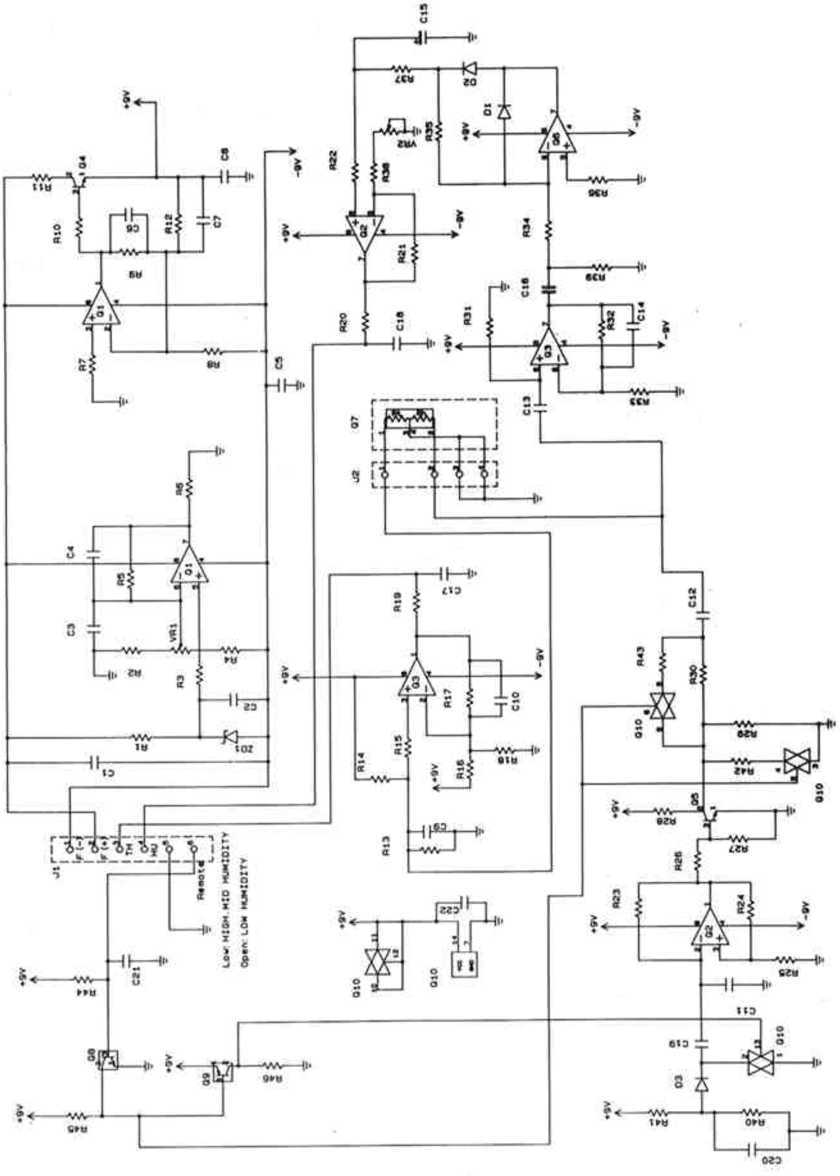
N. TRANSFER DRIVER CIRCUIT DIAGRAM


IC101
IC102
IC103
IC104
RA101
RA102
D101
D102
Q101
Q102
Q103
Q105
B-LEG
A-LEG
+24V
+5V

O. BD CIRCUIT DIAGRAM

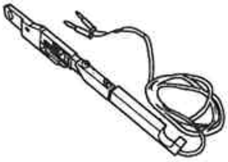
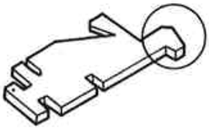
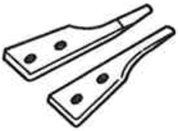
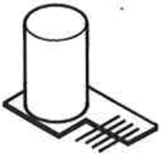

+5V
R306
-5V
C301
J301
C302
J301
+5V
R302
D401
C307
C305
+5V
C303
J301
C304
J301
Q302
D301
Q301
NJM360M
R303
TP301
J301
R301
R304
TP302
C306
R307
-5V
R305

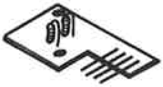
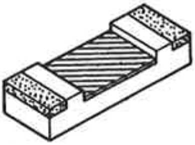
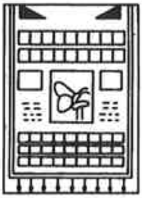
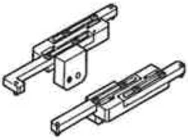
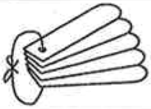
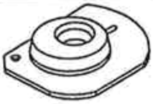
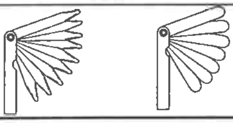
P. ENVIRONMENT MEASURING CIRCUIT DIAGRAM


J1
F(-)
F(+)
TH
HU
Remote
Low: HIGH, MID HUMIDITY
Open: LOW HUMIDITY
J2
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
D1
D2
D3
ZD1
VR1
VR2
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
R34
R35
R36
R37
R38
R39
R40
R41
R42
R43
R44
R45
R46
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
+9V
-9V

Q. SPECIAL TOOLS

You will need the following special tools in addition to the standard tools set to service the machine.

No.	Tool Name	Tool No.	Shape	Rank*	Remarks
1	Laser power checker	FY9-4013		A	Use it when adjusting the intensity of the laser from the laser unit; to be use in combination with a digital multimeter.
2	Digital multimeter	CK-0436		A	Use it when adjusting the intensity of the laser from the laser unit; to be use in combination with the laser power checker to adjust the intensity of the laser from the laser unit.
3	Door switch	TKN-0093	Point to use 	A	Do not remove the transfer assembly frame while the door switch is on.
4	Stop ring pliers end replacement	CK-0426		B	Use it when removing the grip stop ring; 4 to 9 mm.
5	Environment sensor checker	TKN-0456		B	Use it when checking the environment sensor.

No.	Tool Name	Tool No.	Shape	Rank	Remarks
6	Environment sensor checker	TKN-0457		B	Use it when checking the environment PCB.
7	Potential sensor checker (terminal)	TKN-0197		B	Use it when making a zero-level check on the surface potential sensor.
8	CA1 test sheet	FY9-9030-000		A	Use it when adjusting or checking images.
9	Mirror positioning tool (front, rear)	FY9-3002-000		B	Use it when adjusting the position of No. 1/No. 2 mirrors; to be used in combination with the mirror positioning tool (rear).
10	S-B gap gage	FY9-3015-000		B	Use it for adjusting the S-B gap of the developing assembly.
11	Positioning tool, photo, drum shaft	FY9-3016-000		B	Use it for adjusting the position of the shaft of the photosensitive drum.
12	Gap gauge	CK-0057-000 or CK-0061-000		B	Use it to adjust the transfer separation claw position.

*Rank

A : Must be kept by each service person.
B : Must be kept by each group of about five service persona.
C : Must be kept by each workshop.

R. SOLVENTS AND OILS LIST

No.	Item	Use	Chemical formula, mixture ratio, etc.	Source	Remarks
1.	Ethyl alcohol (Ethanol) Isopropyl alcohol (Isopropanol)	Cleaning: copyboard, glass, mirror, etc.	C_2H_5OH $(CH_3)_2CHOH$	Local	Take care in handling. All are flammable. Use in a well-ventilated area. Avoid breathing vapor.
2.	MEK	Removing toner or oil stains	CH_3-CO-C_2H_5 Methylethy ketone	Local	Do not use for cleaning the drum, plastic molded parts, or corona wires. Use in a well-ventilated area and avoid breathing vapor. Avoid contact with eyes or with skin.
3.	Hear-resistant grease	Lubricating the drive mechanisms; e.g., fixing drive gear, fixing ass'y, etc.		CANON	Tool No.: CK-0427 (500 g/can; equivalent grease may be used if able to withstand 200°C for extended periods of time.)
4.	Lubricating oil	Lubrication points	ISO VG 68 oil ESSO Feibs K68 MOBIL Vactra oil No. 2 SHELL Tonna oil T68	Local	Equivalent oil can be used. Tool No.: CK-0451 (100 cc)
5.	Lubricant		Mineral oil (paraffin family)	Local	• Uniway 220 (Nihon Sekiyu) • Tool No.: CK-0524 (100 cc) • Alternative Cosmo Dynaway 220 (Cosmo Oil)
6.	Flannel cotton cloth	Cleaning		Local	It should be soft enough for cleaning the drum, and it should not produce lint.
7.	Lint-free paper	Cleaning	Kimberly-Clark Kim wipes 6020-23 × 40 cm, or 6021-13 × 21 cm	Local	It should be soft enough for cleaning the drum, and it should not produce lint.

Note:
Solvents listed are not toxic, but they may produce minor, temporary effects if breathed in a high concentration, or if let to remain on the skin for a period of time. Any effects are temporary, but exercise reasonable caution nevertheless.

Prepared by
OFFICE IMAGING PRODUCTS TECHNICAL SUPPORT DEPT.1
OFFICE IMAGING PRODUCTS TECHNICAL SUPPORT DIV.
CANON INC.
Printed in Japan
Imprimé au Japon

REVISION 0 (JUNE. 1994) [24863/28941/33130]

REVISION 1 (DEC. 1994) [24863/28941/33130]

REVISION 2 (NOV. 1996) [33130]

30-2. Shimomaruko 3-chome. Ohta-ku Tokyo 146 Japan

This publication is
printed on 100%
recycled paper.

Canon

PRINTED IN JAPAN (IMPRIME AU JAPON) 1001AB0.3-15